DOCUMENT RESUME

ED 185 252 CE 024 171

TITLE Synthesizing the World of Work and the Liberal Arts. Career Education Program Project Performance Report. Final Report, October 1, 1977 to September 30, 1978.
INSTITUTION Denver Univ., Colo.
SPONS AGENCY Office of Career Education (DHEW/OE), Washington, D.C.
PUB DATE 30 Sep 78
GRANT G0077C0082
NOTE 116p.: For related documents see ED 132 264 and ED 138 786.

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Career Counseling: *Career Education: Conference Papers: Curriculum Development: Educational Change: Employment Opportunities: Graduate Surveys: Higher Education: *Liberal Arts: Program Descriptions: *Program Development: Questionnaires
IDENTIFIERS Education Amendments 1974: University of Denver CO

ABSTRACT

During the first year of a career education project, the University of Denver integrated career concepts into the programs offered by 10 of the 23 liberal arts departments. The departments were Mathematics, English, Political Science, History, Sociology, Philosophy, Mass Communications, Theatre, Physics, and Anthropology. Program goals were to provide students with counseling assistance and information on job opportunities related to their academic major. The programs designed by each of the 10 departments reflect the nature of the discipline, student needs, and the level of faculty awareness. The varied departmental approaches to implementing career education into the curriculum included student career handbooks, seminar courses, alumni surveys, internships, and class projects. Three of the departments proposed specific curriculum revisions as part of their plan to integrate career education with the traditional academic program. In addition to philosophical problems, there were operational problems in introducing career education concepts within the liberal arts setting, such as heavy faculty workloads. The University instituted a major organizational change to support the project while the departmental programs drew upon community resources to reinforce the University/community linkage. (The appendix comprising approximately three-fourths of this report includes the following: Havelock's Dissemination Model, Mathematics/Computer Science alumni questionnaire with survey results, Mathematics Career Handbook, History Career Handbook, English career advising survey instrument with results, and two papers presented by Kenneth Hoyt: Paradoxes and Potential for Career Education in Higher Education, and Some Thoughts on Career Education and the Liberal Arts.) (EM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED185252

CAREER EDUCATION PROGRAM
PROJECT PERFORMANCE REPORT

UNIVERSITY OF DENVER
Final Report

SYNTHESIZING THE WORLD OF WORK
AND
THE LIBERAL ARTS

Grant Number

G0077C0082

Period Covered

October 1, 1977 to September 30, 1978

Project Director

Anne W. Carroll
University of Denver (Colorado Seminary)
University Park
Denver, CO 80208

CE 024 171

U S DEPARTMENT OF HEALTH.
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CAREER EDUCATION PROGRAM
PROJECT PERFORMANCE REPORTS

Form approved
OMB NO. 51-R1187

1. PROJECT NUMBER
10066-2395

2. GRANT NUMBER
G007700082

3. NATURE OF REPORT
Final Report

4. PROJECT TITLE
SYNTHESIZING THE WORLD OF WORK AND THE LIBERAL ARTS IN HIGHER EDUCATION

4. PERIOD COVERED BY REPORT
From:
Oct. 1, 1977
To:
Sept. 30, 1978

6. CATEGORY OF PROJECT (as specified in 45 CFR 160d.5 and 160d.11

__INCREMENTAL __SETTINGS __POPULATIONS X TRAINING

__STATE PLAN __COMMUNICATIONS

7. NAME OF PROJECT DIRECTOR
Anne W. Carroll

8. NAME AND ADDRESS OF GRANTEE/ASSISTANCE CONTRACTOR INSTITUTION
University of Denver

TELEPHONE

AREA CODE	NUMBER
303	753-2427

TABLE OF CONTENTS

Page

I. INTRODUCTION 1

Overall Project Goals 2
First Year Objectives 2

II. INTRODUCTION OF THE ACADEMIC/CAREER EDUCATION CONCEPT 4

Department of Mathematics 4
Department of English 6
Departments of Political Science and History 6
Other Departments 6

III. DEPARTMENTAL ACADEMIC/CAREER EDUCATION PROGRAMS 8

Department of Mathematics 8
Department of English 9
Departments of Political Science and History 10
Department of Sociology 13
Department of Philosophy 13
Department of Mass Communications 15
Department of Theatre 16
Departments of Physics and Anthropology 17

IV. ACADEMIC/CAREER EDUCATION CURRICULAR REFORM 19

Department of English 19
Department of Mass Communications 22
Department of Mathematics 24

V. PHILOSOPHICAL AND OPERATIONAL CONCERNS 26

VI. INSTITUTIONAL AND ORGANIZATIONAL MODIFICATIONS 28

Academic and Career Services 28
University and Community Interaction 29
Faculty Commitment and Curricula Modification 30

APPENDIX A

Havelock Model

APPENDIX B

Mathematics/Computer Science Alumni Questionnaire

APPENDIX C

Department of Mathematics Career Handbook

APPENDIX D

Department of English Alumni Questionnaire

APPENDIX E

Department of History Career Handbook

APPENDIX F

"Introduction to Undergraduate English Studies: Career Advising" Syllabus

APPENDIX G

Survey Instrument and Analysis

I. INTRODUCTION

The University of Denver with the assistance of OCE funds, implemented the unique and slightly foreign notion of career education into its traditional liberal arts program. The blending of career principles within the liberal arts at a multi-faceted university formed the central focus of first year project efforts. Acceptance of the idea varied from those who questioned the validity of these endeavors to others who were skeptical but willing to try.

A basic concern in the implementation of the career concept within a liberal arts framework addressed a strategic question - could it be done? The departmental programs initiated in the first project year gave strong indication that the faculty and students of a liberal arts college are willing to accept the premise that students want and need better information about the world of work, and that they need assistance in viewing the merger of academic and career education for wise planning and decision making. The acceptance of this basic premise forms the foundation for continuing and expanding project activity. Some evidence is even present to show that instruction was enriched and made more meaningful to the faculty when information on the relationship of work was included in the class activity.

During the first year of implementation, the career education concept was introduced in ten of the 23 academic departments. The individual plans developed by each of the ten departments were unique in some areas and similar across all departments in other areas. Unique characteristics emerged to the extent that different academic departments held different perceptions of the world of work and student needs. Similarities occurred in that contact with the community through alumni or other business persons were included in their plans. Breaking down the isolation between formal education and the world of work appeared to be a thread common to many of the departments. In many departments the plans to reach students followed a traditional approach of a student seminar. It is expected that efforts to embellish and elaborate on the student seminar will be undertaken in the second project year.

At the beginning of the project, two overall goals were established. These goals were ambitious and only partially obtainable during the first year.

Overall Project Goals

I. The University will initiate a faculty based career education program which, when fully implemented, will provide students with counseling assistance and information on jobs and work opportunities related to their academic major so that:

   A. Students will make course and major selections with knowledge of how these decisions could affect employment after graduation.

   B. Students will be assisted in developing and refining their job entry and adaptability skills needed for obtaining the first job out of school.

   C. Faculty will be assisted in obtaining job placement information which can be used to alter course sequence and major requirements and give them information needed to carry out their department counseling plan.

II. The University of Denver will make institutional and organizational modifications necessary to integrate career preparation into liberal arts programs.

In order to direct effort to these global goals, first year objectives were specified:

First Year Objectives

1. Introduce the career education concept in ten of the 23 academic departments.

2. Assist each of the ten academic departments in developing their own plan for giving career information and counseling to the "majors" of their department including assistance in the collection of information and the development of materials necessary to carry out the department plan.

3. Assist the academic departments in field testing the student seminar plan during the Spring Quarter.

4. Identify the operational and philosophical problems encountered in initiating the career education concept in a liberal arts university setting.

5. Initiate a program to develop faculty awareness and commitment to an integrated academic/work relationship.

6. Explore the possiblity and develop a plan for utilizing multiple resources and flexible approaches to teaching/learning processes within the liberal arts departments.

7. Develop a plan for integrating the university's academic advisement, specialized assistance and career counseling services to students.

8. Develop a plan to make increased use of the collaborative efforts of university staff and resources from the business/labor/industry community to enhance student opportunity for academic/work-related experiences.

9. Prepare an evaluation and/or final report which can be used by the funding agent and other universities for replicating the program in other liberal arts institutions.

This final report is an effort to evaluate the effectiveness of activities directed at these first year goals. It will review past accomplishments and point up changes and improvements needed. Each academic department will be examined in light of the activities in which they were involved and the relationship of these activities to the project goals. Differing points of view and questions needing attention during the second year will also be identified. While the report is to serve as a final review of first year activities, it is also meant to serve as a useful tool for University of Denver officials, department chairpersons, and other faculty and project staff as they begin the second year activities.

II. INTRODUCTION OF THE ACADEMIC/CAREER EDUCATION CONCEPT

The faculty-department based career education program was initiated at the University of Denver on October 1, 1977. Using the Havelock Model for affecting change and dissemination (Appendix A), career education concepts were introduced in ten of the twenty-three liberal arts departments at the University. The specific departments were Mathematics, English, Political Science, History, Sociology, Philosophy, Mass Communication, Theatre, Physics, and Anthropology. The introduction of career principles was to promote faculty awareness of career education concepts and to lay the foundation for a commitment to integrating career education principles into the academic program. This first section will recount the nature of these introductory vists in the order that each department was contacted.

Department of Mathematics

Project staff met with the Department of Mathematics Chairperson to discuss the aims of the academic/career education project and possible areas for blending academic and career planning into the undergraduate mathematics program. Two of these areas were curriculum revision and academic advising sessions. The importance of faculty involvement and the need for a departmental plan for fusing career and academic preparation were stressed.

The Chairperson expressed his interest in working with the project staff on the development and implementation of a career program designed to meet the needs of undergraduate students engaged in studies in mathematics and computer sciences. He subsequently presented the project's goals to departmental faculty for endorsement of the career directions proposed for that academic year. A faculty member who was particularly interested in pursuing this area then joined the Chairperson as the departmental representatives. Those individuals formed the core team who would work with project staff to design, implement, and disseminate a departmental plan for meshing academic and career concepts.

The project staff maintained close contact with the core faculty for periods of intensive interaction in order to facilitate changes in attitude toward career education and to broaden perspectives on key concepts. Three formal meetings were scheduled between project staff and core faculty. Informal sessions and a series of phone conversations over a three-month period supported efforts for establishing concept exchange and rapport. The interaction was a mixture of presentation and debate on the nature, intent and extent of career education.

The philosophical problems encountered centered upon: (1) the role of career education in a liberal arts setting, (2) the achievement of a balance between career education concepts and the liberal arts curriculum, and (3) the blending of career principles in a liberal arts program within a university setting. All of these were examined in light of producing an enhanced liberal arts curriculum rather than a threatened general education program. These issues were addressed in relation to benefits to students in planning and preparing for life goals; benefits to faculty for assisting students; the value of faculty interaction with the community; and the value to the institution for increased commitment to society and its future leaders. As the academic/career ideal of a truly integrated approach to total education was presented and discussed thoroughly, the faculty able to move from the more standard perception of liberal arts education to a more enhanced and enlarged concept of a comprehensive academic/career education.

seemed to move from the more standard perception of liberal arts education to an enhanced and enlarged concept of a comprehensive academic/career education.

Interaction with core faculty also included questions raised by the project staff to help determine the career education needs of this particular department. Information was shared by the faculty as to the projects they had already established which focused on career principles. The project staff offered suggestions for program activities, but these suggestions were meant primarily to serve as stimuli for the faculty to develop its own plans and programs. A number of operational objections became apparent. These included heavy faculty work loads; demands on faculty for research; and a lack of rewards for academic advising. To alleviate some of these concerns, project staff offered service designed to reduce the time commitment of core faculty in implementing any of their plans for academic/career activities. As the operational and philosophical problems encountered in initiating the career education concept were identified and addressed*, the departmental plans for a career education program started to take shape.

---

*A more detailed discussion on the operational and philosophical problems appears in V, page 26.

Department of English

A similar procedure was followed in introducing the career education concepts to the Department of English. Three faculty members comprised the core team for their departmental program. The topics discussed, the nature of the discipline, and the perceived needs of the students differed from the Department of Mathematics. The philosophical objections encountered in the Math Department were not apparent in discussions with these faculty members. In this humanities discipline, the faculty were keenly aware of the gap between the traditional liberal arts concepts and the world of work. They felt that the integration of academic and career principles was especially necessary for students in a humanities area. Such students tended to perceive the English major in isolation from career goals much more so than students majoring in the sciences. As their program developed, the enthusiasm of the core faculty integrating academic and career ideal was captured and their plans continued to be intensified.

Departments of Political Science and History

The Departments of Political Science and History were then approached. Since the core faculty in both departments saw great similarity in their programs and student needs, they combined some of their planned activities. Student advisory groups from both departments joined in the discussions and were involved in the development and implementation of their departmental career education programs. One critical need for this faculty, as with many of the core faculty in the ten departments, was for accurate up-to-date career information. Most faculty freely admitted that they had been in academia for some time and were not aware of career opportunities or trends. They felt they could not adequately advise a student in career planning with a lack of career literature or with a lack of communication with the business, labor, industrial or government community.

Other Departments

The contacts made with the Departments of Sociology, Philosophy, Mass Communications, Physics, Anthropology, and Theatre closely paralleled the contacts with the Departments of Mathematics, English, History and Political Science. The Havelock Model continued to be utilized in the introduction of the career education concept. Subsequent development of a departmental career education plan proceeded in a manner similar to those already described. For example, the Departments of Mass Communications, Theatre, and Anthropology had already obtained a moderate amount of career information and were more interested in building on their existing base of career awareness. On the other hand, the core faculty in Philosophy were greatly concerned that the notion of a liberal arts education be enhanced, not threatened, by career concepts. Based upon their strong commitment to student needs, the Philosophy Department faculty concluded that student input on relevant issues was desirable and that there was a need to blend traditional academic principles and career education. In a slightly different position, the Department of Theatre's core faculty saw the fusion of academic and career education as giving students the opportunity to experience the world of work while pursuing their academic goals. They felt this combination would better prepare their students for integrating the two areas.

In summary, the comprehensive plans developed by the ten departments integrating career concepts in their traditional liberal arts curriculum and students advising programs reflect: (1) the nature of the disciplines, (2) the perceived needs of students majoring in each department as assessed by the faculty, and (3) the attitudes or level of career awareness of the faculty involved.

III. DEPARTMENTAL ACADEMIC/CAREER EDUCATION PROGRAMS

The programs designed by the core faculty in collaboration with project staff reflect the extent to which academic and career principles were integrated into departmental programs at the University of Denver during the first project year. These activities indicate the diversity of the planners and of the disciplines as well as the common striving for fusion between academic tradition and the world of work. These programs mark the inroads made into the heart of the liberal arts but should be viewed only as an initial step towards the integration of academic and career education.

Department of Mathematics

The plan developed by the core faculty in this department through the active involvement of project staff included three major activities: (1) an alumni questionnaire, (2) a student career handbook, and (3) inclusion of a career module within a scheduled seminar.

The first activity involved obtaining in-depth information from alumni on career and academic concerns. This was accomplished through a questionnaire sent to math alumni (Appendix B). The results of the analysis performed on the responses from alumni over the past twelve years showed careers entered and types of employers. Alumni assessment of the academic program in relation to job entry and job performance gave valuable insight for curriculum review. For example, the analysis showed that 42 of 147 positions held by mathematics majors were in the field of Computer Science. This included computer programmer, systems programmer and systems analyst. The analysis also examined alumni findings as to the relevancy of their education to their career field and to their job performance. More than half of the graduates from 1970-1977 indicated that the mathematic/computer science program was extremely or significantly important in getting their job. The analysis was shared with other members of the faculty beyond the core faculty in order to raise the overall levels of faculty career awareness. The results, in summarized form, will also be disseminated to undergraduate majors through a career handbook.

The implementation of this student career handbook comprised the second major activity of the department's plan (Appendix C). The core faculty and project staff jointly prepared the handbook entitled, "A Guide to Careers in Mathematics and Computer Science". Three sections comprised the handbook. The first section presented career leads based upon the alumni questionnaire analysis. Hiring institutions, types of positions available, and a summary of alumni opinions were highlighted. Job search techniques comprised the second section. The importance of making contacts through the faculty and professional associations, resources available on campus or off campus, and the value of work experience while pursuing the academic degree were stressed. The third section, a discussion of graduate school options and general entrance requirements completed the topics covered in the Handbook.

The third major activity involved a career module for one class period as part of the regularly offered mathematics seminar for freshmen and sophomores. The class offering included discussions on specific career fields, participation of alumni, and information from the alumni questionnaire analysis. A more complete description of this activity appears under IV, page 24.

Department of English

The English Department's plan to implement academic/career education involved: (1) the development of an alumni questionnaire similar to that of the Department of Mathematics, and (2) a new curriculum offering on career advising for English majors.

Turning first to the questionnaire, (Appendix D) the core faculty were extremely interested in analyzing the views of alumni over the past ten years on the relationship of their academic preparation to their career goals and to their life goals. The results of the analysis of the questionnaire would be used for curriculum changes as warranted.

The 168 responses from the alumni were broken down into three categories: (1) alumni with an undergraduate degree in English (58%); (2) alumni who did their undergraduate work elsewhere but received a graduate degree in English from the University of Denver (26%); and (3) alumni who received both an undergraduate and graduate degree in English from the University of Denver (16%). Four items on the survey directly addressed the relationship of a degree in English to career planning and job performance.

The first item asked if more career planning as part of the English major was preferred. The undergraduate group responded overwhelmingly that it was preferred (89%), with over half in each of the other two categories indicating a preference for more career training. When asked what the career training might entail, 34% of the undergraduate group, 25% of the graduate group, and 19% of the combined group felt that career training should be in the form of actual career advising. The remaining responses were relatively evenly divided among a need for more expository writing, a desire to analyze more non-literary writing, and a desire for more practice in speaking in front of groups.

A second item addressing the academic/career relationship asked: "Do you see your work in English at the University of Denver primarily as career training? general education? or neither?" The opinion of all three groups responding viewed their work in English as providing a general education background. In addition, approximately 40% with a graduate degree saw their work in English as career training.

The final two items examined the relationship of a degree in English to getting a job and performing a job. Of 459 positions indicated by the three groups, over half of the respondents felt their degree in English was either somewhat, significantly or extremely helpful in getting a job and in their performance on the job. Less than 20% felt an English degree was not at all helpful in getting or performing a job.

The second activity involved in the Department of English academic/career education plan was the development and implementation by the core faculty of a career seminar primarily for freshman and sophomore students majoring in English. The new colloquium for academic credit was entitled, "Introduction to English Studies: Career Advising," and was offered Spring Quarter, 1978. The course was designed not only to advise students on possible career fields, but also to ease the integration of their academic program with desired career goals. Adaptability was stressed. The course offering included: (1) discussions on specific career fields, (2) entry and advancement tips, (3) work experiences and life styles presented by participating alumni, other members of the business/labor/industrial community, faculty and graduate school representatives.

The guest participants in the seminar could be viewed as a community advisory board for the Department of English. This Board would provide additional cooperative assistance and consultation in meeting the expressed needs of the department for career field awareness and information during the second year of the project. A more detailed description of this seminar appears in IV, page 19.

Departments of Political Science and History

The core faculty and student advisory boards in these two departments worked cooperatively with the project staff in developing their departmental plans. The plans showed two major concerns. The first concern emphasized better communication between the faculty and the community in order to enlighten both groups as to the current career and academic trends. The basic assumption was that faculty were isolated from the world of work and consequently career information and assistance were needed.

A major activity to encourage faculty-community awareness was to bring together members of government, business and non-profit organizations with the core members of the faculty and student advisory group representatives. Since the need was for intensive interaction, the meeting was planned for a small informal exchange over breakfast.

At the meeting, the community resource people told of their organization, job availability and requirements, and gave tips on how to accurately advise students for entry into these areas. Some of the other questions posed and discussed were:

a. What emphasis is placed on grades for hiring practices?

b. Are these employers looking for students in specific liberal arts fields or liberal arts in general?

c. Should liberal arts students have some business courses as part of their curriculum?

d. What suggestions would these employers have for curriculum reform?

One representative from a private business concern told of his company's interest in candidates with a broad liberal arts background, solid command of basic skills, and a genuine interest in business, regardless of what their undergraduate major had been. Another representative emphasized the growing need for individuals who could manage records and pointed out the lack of such individuals and appropriate programs for training them.

A Denver Career Service authority stressed the large number of job categories in which candidates with a liberal arts degree might apply. It was pointed out, however, that a relatively small number of actual job openings existed compared to applicants, and a large proportion of these jobs might be unsatisfactory to a graduate.

A representative of the Federal Civil Service Commission reported a surprising drop in applicants for the PACE examination*. As a result, prospects of employment for those gaining a position on the register were greatly improved. Prospective federal employees were urged to consider accepting appointments in undesirable areas as a means of gaining entry to federal service. This would increase access to professional jobs and desirable locations.

All representatives stressed the importance of an effective command of communication skills, including the ability to present oneself well in an interview. They also pointed out the need for an additional special skill in order to gain a first position. Most of the representatives concurred that employers expected and preferred to do much of the training for particular positions themselves.

The faculty of Political Science and History queried the business representatives at some length on the question of the desired balance between general and specialized skills.

The meeting ran well past the appointed conclusion with many participants lingering to express appreciation or pursue matters of interest.

The core faculty then approached the project staff to relate their satisfaction with the exchanges. They intended to disseminate the information they had been provided to other faculty in their respective departments.

The second concern of the Political Science and History Departments' plan emphasized more communication with their undergraduate majors in the specific areas of career awareness and preparation.

*PACE (Entry level examination for federal government employment)

In order to accomplish this second goal, the departments designed a career handbook for their students (Appendix E). Information from the faculty/community exchange was incorporated into the handbook. The Alumni Association provided information on job positions held by alumni over the past five years for a section on career position trends. The handbooks also examined career fields, academic requirements, a candid discussion on job availabilities, job search techniques and career planning resources on campus. In addition, a section including source documents available from professional associations relating to careers was incorporated into each booklet.

The handbooks will be disseminated to students during advising sessions with faculty during the Fall Quarter, 1978. With faculty guidance, students can become more keenly aware of the integration between their life goals, career goals and educational preparation.

Department of Sociology

The core faculty in this department were interested in relating career information to their undergraduate majors. The department had established some activities in coordination with the Career Planning and Placement Service on campus. Due to internal departmental pressures, more extensive activities could not be developed until the following year. They did feel, however, that a student career handbook similar to that of the Departments of History and Political Science would fit their needs at the present.

The project staff worked closely with the core faculty in preparing a "Careers in Sociology" handbook to be disseminated to students during academic advising sessions. The Alumni Association provided relevant information on the career trends of recent Sociology alumni for inclusion. In general, topics covered in this handbook were similar to those of History and Political Science. Several sections were added on integrating sociology with other disciplines in order to provide a wider range of career pursuits. A discussion on the preparation for social work exemplified this type of combination program.

Department of Philosophy

An initial concern of the core faculty in this department was a desire for basic information on the career choices of their alumni. They wanted to determine if there were any identifiable career patterns which emerged. Information on the career positions held by alumni over the past ten years was reviewed. Of the 59 reporting graduates, 47% were in business and industry and 19% held positions in educational institutions. Based on this preliminary review of career positions, a workshop was planned for interested students and faculty to discuss academic/career education concepts further. At the workshop the list of positions held by recent alumni and their employing companies was reviewed and commented upon. A core faculty member then opened the debate on the role of career education in the liberal arts area -- particularly philosophy. Faculty and students expressed concern about the fusion of liberal arts and career education. Project staff gave the highlights of career programs developed in other departments to ease the concern and to stimulate ideas for a program in philosophy.

It was decided that the students majoring in this field should be given the opportunity to express their opinions on career needs. A questionnaire was drafted by project staff for faculty review. The questionnaire would then be given to majors Fall Quarter, 1978, to assess the interests of the students for a career program.

Sample questions included:

1. Are you planning to enter a career field after you receive the B.A. Degree?
2. Are you planning to enter graduate school?
3. Do you think that a major in philosophy will help you in getting a job?
4. Do you think that a major in philosophy will make you more effective in a job situation?
5. Is there a relationship between your career goals and your major in philosophy?
6. Is it difficult to convince people that the philosophy major is valuable?
7. Would you like to know the career positions other philosophy majors have entered?
8. Are you interested in more information about careers for philosophy majors?
9. Would you like to engage in further discussions of the above questions?

The results of the questionnaire could then guide the department in responding to student needs and give directions for program planning during the second year of the project.

Department of Mass Communications

The core faculty of this department were keenly aware of career and academic principles. They presented their understanding of and approach to the study of mass communications as a subject properly classified among the liberal arts. This understanding and approach was based on the fact that the department had moved away from its former emphasis upon production techniques to an emphasis on the conceptual basis of Mass Communications. Although the curriculum is heavily oriented to actual or simulated student projects performed as a service for community organizations or educational institutions, the core faculty viewed the academic/career education project as an opportunity not only to learn techniques, but also to apply insights learned in many other disciplines. Core faculty characterized their approach as a "contemporarily-based liberal education." To accomplish this approach, the department had reduced its own requirements and expected a broader preparation in other areas from its students.

Mass Communications at the University of Denver is, therefore, already structured around application in careers. Most faculty combine professional practice with teaching and research. In addition, class projects, internships, and a number of career weeks reflected the career orientation of the department.

The faculty suggested that there was a definite need to assist students in individual career preparation. It was suggested that the senior seminar would be the best vehicle for career information. In the past, the seminar had focused on media projects and was not successful. Faculty and project staff then conferred on the possible format and purpose of the seminar for Spring Quarter. Since the students attending the seminar would be graduating at the end of the quarter, the focus would be on specific career preparation. In brief, the students would be asked to state their short range and long range goals, how they planned to meet these goals, active pursuit of information about specific employers in their chosen field, and preparation of their portfolio to include resumes, etc.

The two-credit course would begin with a formal session and subsequent meetings would be held on an appointment basis with the faculty members. Project staff would participate in the opening session as resource persons and students could also see project staff throughout the quarter for assistance. Further details on this course appear under IV, page 22.

Department of Theatre

This departmental plan focused on more extensive involvement of students in undergraduate internships and apprenticeships within the community. Presently, opportunities for working in the community were available to students on a very limited basis. Involvement in such opportunities was dependent upon the student's own initiative in finding them. The department provided some assistance by supporting these efforts through the identification of leads and assisting in working out the academic logistics.

A variety of potential employers existed for apprenticeships: (1) advertising agencies, (2) architecture and design firms, (3) museum displays, (4) Denver Center for the Performing Arts, (5) Council of the Arts, (6) other foundations, (7) business corporations, and (8) local mental health institutions. Campus resources such as the Placement Office and the Cooperative Education Office would be called upon for assistance.

Several basic issues related to the expansion of internship opportunities were discussed with the core faculty:

1. Is there anything in the present departmental structure that lends itself to serving as a base for internships? The department's philosophical attitude regarding the importance of students having practical experience was apparent. There were several questions raised: (1) the relationship between the required practicum and an internship, (2) the number of credit hours offered, (3) the kind of supervision necessary and (4) the method to be used to evaluate an internship experience. These areas would have to be addressed in order to assure that apprenticeship opportunities remain consistent with the department's desire to retain the quality of these activities.

In addition to the department's structural arrangements, some questions were raised regarding the needs of the students. Would double majors derive more benefit from a different program design for the internship? Would salary arrangements (no pay, minimum wage or substantive salary) effect the learning experience?

2. What experiences would be the most helpful supplements to students' classroom learning? Are there greater experiential needs in the areas of business and management of theatre? Should apprenticeship possibilities be expanded to include such areas as fund raising, organizational analysis, or skills specific to T.V. ad production?

3. What are some possible locations for the apprenticeships besides the Denver metropolitan area. Additional opportunities might be available in Aspen, Chicago, New York, or Santa Fe. Inclusion of out-of-town areas requires arrangements similar to those made for cooperative education and study-away programs. To insure quality at these locations, existing ties with alumni could be utilized.

4. What specific skills should interns be expected to perform? What skills could be learned in a given time period? How can skills best be evaluated? These questions raised the issue of the best placement for an internship experience in a four-year program. Participation in an internship program should maximize the balance between the student's learning objectives and work objectives.

Since the contact with this department was made late in the project year, the implementation of their program would not occur until the following year.

Departments of Physics and Anthropology

These two departments were among the last to be contacted and their plans would continue into the second project year for implementation. The procedural plan for engaging in intensive discussions with core faculty in introducing the career education concept was followed.

Preliminary discussions centered upon establishing rapport with the core faculty and proposing possible programs for consideration and review. The Department of Physics emphasized the need to reach their undergraduates with career information to raise their levels of awareness and preparation. Core faculty preferred a seminar-type course as the method of implementation. The faculty from the Anthropology Department deferred discussions with project staff on the development of a program until the start of the second project year.

IV. ACADEMIC/CAREER EDUCATION CURRICULAR REFORM

Three liberal arts departments at the University of Denver, (English, Mass Communications and Mathematics) proposed curriculum revisions as part of their academic/ career education departmental plans.

Department of English

The core faculty in English proposed a seminar entitled, "Introduction to Undergraduate English Studies: Career Advising". The seminar was designed as a new curriculum offering for credit within the departmental structure. The fact that a course offering which focused on career principles took its place among the traditional academic offerings was significant. It was a strong indication of the stress the department's faculty placed upon career education and of the need for raising student awareness about the importance of integrating a pure liberal arts discipline with the world of work. The intent of the course was multifaceted: (1) to promote the usefulness of the English major in professional pursuits, (2) to underscore the value of an English background for raising the quality of life, (3) to support continued English studies, and (4) to promote the major as valuable training for the business/ labor/government world.

By placing the course at the introductory level of the curriculum, the faculty was expressing the desire for students to become aware of the relationship between career and academic planning at the beginning of their college career. Early exposure to the academic/career education concept facilitates the integration of the concept into the planning of an undergraduate program.

The content was designed to encompass a wide range of topics for students to explore (Appendix F). These included an overview of career avenues, a chance to experience the differing views of professions in the field (both faculty and community representatives), and to begin relating their choice of the English major to long term life goals.

The ten sessions were planned to include discussions on English as a preprofessional major as presented by two members from the core faculty. Career information materials were obtained from the Modern Language Society and were used in place of text books. Alumni presentations on the fields of publishing, federal and state agencies, and other business enterprises were scheduled. Representatives from graduate study areas such as Librarianship, International Studies, and Law were asked to participate to broaden student perspectives on the state of graduate studies in English. The Director of Career Planning and Placement on campus was scheduled to provide students with strategies for selling their talent to prospective employers.

Since this seminar was developed within the academic year for an offering that same year, it was not in the regularly published class schedule. Publicity for the course was handled by faculty at advising sessions, by an announcement in the student newspaper, and by an article in the English Department's newsletter.

Thirteen students enrolled in the course for credit, but as the quarter advanced, other students began attending the sessions for no credit.

As an example of an actual class period, one of the sessions involved an alumni participant from the federal government. The speaker told of his educational background, his job entry experiences, and how he advanced in his career field. He discussed his position and the opportunities available for attending training workshops sponsored by the government for acquiring skills needed to advance in a chosen career field. He gave advice to the students about job entry within federal government agencies. Through interaction with the students and faculty, the alumni speaker addressed the use of his educational background in English to the work setting and also as part of his total life style - particularly in leisure activities. He spoke to the change in life style from student to employee and noted major contributions to humanity which could be made by combining educational and work related activities.

At the completion of the seminar, the students were given a survey instrument to assess the value of the course from their perspective (Appendix G).

Ten of the thirteen enrolled students returned the survey and their response was overwhelmingly positive. When asked if the course stimulated their thinking about career options and if they learned about new career possibilities for their major field, 70% indicated this was the case. Although over half of the students felt the course was only somewhat helpful toward making a career decision, all of them recommended the course for other students. In addition, 90% of the respondents felt the speakers from the business/government community promoted their information clearly and candidly.

Students were particularly pleased with information presented by speakers from the areas of government, law and publishing. On the other hand, respondents indicated information presented on the graduate schools of Librarianship and International Studies was the least helpful and probably could have been omitted. Over half of the students indicated the addition of more information or speakers from media-related fields would be beneficial. Most of the students participated in the seminar because they wanted to learn more about career possibilities for an English major. All of them felt that objective was satisfied by the seminar. The overall student attitude on the value of the seminar was that it was an extremely positive experience which was helpful, thought-provoking and should be continued.

The two faculty members co-teaching the course were asked to discuss their reactions to the career advising colloquium. Both deemed the course extremely successful and noted that the students responded well to the speakers from the community.

One of the faculty members stated that she did not find it easy to co-teach the course in philosophical terms; it seemed so totally foreign to teach a course such as poetry. However, as the colloquium progressed, the difference lessened. It is perhaps this difference, however, that speaks to the need for infusion of career education into the liberal arts curriculum more strongly than the career course itself. She addressed this issue at a meeting of faculty advisers in the College of Arts and Sciences and told of her personal experiences in teaching the colloquium. She suggested that the other faculty members in attendance begin thinking of career education as an enlarged concept of liberal arts education and pursue the possibility of establishing a curriculum offering similar to the seminar she had just described.

The second faculty member, who was more extensively involved with the project staff as a faculty consultant in the academic/career education project as a whole, also evaluated his experience in broader terms and felt he needed to integrate career education more thoroughly into the traditional education concepts and modes so as not to have just isolated courses on career exploration and advising. With this successful base, both faculty members agreed to offer the seminar during the second year of the project and to bring career concepts into certain regularly scheduled offerings. They also have influenced other members of their faculty to take a closer look at the curriculum as a whole for changes in keeping with the career focus.

Department of Mass Communications

Given the career focus of the discipline, the assumption was made that students majoring in this field had a firm basis in career awareness and exploration. Career education was implemented in their curriculum by means of expanding a regularly scheduled seminar for final quarter seniors which had not been designed prior to meeting with project staff. It was decided that this forum could be used to offer a course on individual career preparation. Students would be asked to perform special tasks: (1) determine their long range and short term career goals, (2) plan a strategy to meet those goals, (3) actively pursue information from members of the community in their chosen career fields, (4) investigate job opportunities, and (5) prepare their portfolio of resumes, samples of their work, etc.

The structure of the seminar was designed after an independent study format. The first session would be a formal class presentation. After that, students would meet the requirements of the course on their own time receiving individual assistance from the faculty member and the project staff, by appointment, throughout the quarter.

Fourteen students enrolled in the seminar for two hours of credit.

At the first session, the faculty member began the class with introductions. He gave a brief overview of the purpose of the seminar as the development of individual plans for career preparation. He stated the plan would include the setting of short range and long range career goals, the investigation of job opportunities and the development of a portfolio. Students had available to them the University resources to assist them in interviewing techniques, resume writing, and job contacts, as well as faculty assistance.

The professor then described his entry into the field of film, his advancement leading to his current position as professor of mass communications, and the struggles and sacrifices along the way. The class was then turned over to the Project Coordinator.

The Coordinator began with a discussion on self-assessment. What were the students interests, possible handicaps, concerns of spouses, geographical restrictions, monetary needs? How do the individual responses to these questions effect career pursuits? The discussion then focused on how to prepare job entry-resumes, interviews, samples of media projects or writing, how to focus on their academic program to show specialization, and general communication skills. The next area covered was contacts-professional associations, faculty, placement service. A list of positions obtained by alumni of the program over the past two years was presented as an indication of the variety of possible career fields.

The faculty member ended the session by informing the students that they should consider the class as an independent study and make appointments to see the Director of Career Planning and Placements, the Project Coordinator, and/or faculty for directions and assistance.

Certain students attended workshops sponsored by the Career Planning Office for assistance in portfolio preparation and to obtain listings of community representatives to contact about the types of career fields and the status of job opportunities in those areas. Other students took advantage of the assistance offered by the faculty member responsible for the course and the project staff.

At the end of the quarter, each student prepared a paper on their career goals and discussed the interviews they had with community leaders and how this modified or enhanced their goals. They also submitted their portfolios. After grading, comments, and words of assistance by the faculty member, all papers were returned to the student for his own use in his job-hunting activities.

The faculty member then discussed his assessment of the course. He thought the career preparation seminar went fairly well but concluded that some of the students were confused about career goals and lacked training in career planning. He felt that student internships in the community prior to the senior year would have enhanced their awareness of career concepts and students would then be better able to meet the requirements of the career preparation seminar. He also suggested that more formal structure be placed in the seminar to assist those students who were ill-prepared for the assignment. Although it was initially assumed that the career focus of this department would account for a sufficient blend of career and academic concepts to ensure student readiness for an individual career preparation course, the faculty and project staff concluded that additional efforts were needed to assist students with academic/career planning prior to the senior year.

Department of Mathematics

The Department of Mathematics core faculty developed a class module addressing career concerns for inclusion in their freshman/sophomore seminar on research topics in Math and Computer Science. An alumnus was scheduled to speak to the class and the core faculty and Project Coordinator would attend an open discussion. The seminar was taught by a faculty member who was not part of the core team.

There were eight students in attendance, five enrolled and three visitors. The class session was opened by the faculty member teaching the course. He introduced the other two faculty members in attendance, and the Project Coordinator. The Chairperson then gave an overview of the nature of the class session and introduced the alumni speaker from Hughes Aircraft.

The alumni representative described her position and commented upon her academic preparation. She stressed analysis and problem solving as extremely helpful, as well as computer science and personal development courses. She addressed such job entry techniques as the importance of previous part-time work experience while a student, resume preparation, and tips for interviewing. She responded to questions on life style, advancement opportunity, differences between degrees for job entry and performances, and the importance of personal contacts in getting a job.

The Project Coordinator reviewed the "Careers in Mathematics and Computer Science" Handbook that was developed as part of the department's career education plan and asked that students read and critique the handbook with suggestions due in the next class session. After the discussion on careers by participating faculty, one faculty member ended the session by stressing the importance of professional associations for students to begin conversing with professionals in a variety of math-related professions.

The core faculty members were asked to comment upon the class module later that week. One faculty member thought the session went fairly well and stated that the students were more enthusiastic than at any other class session on research topics. He was most impressed with the alumni speaker and would like to offer this session again on an annual basis expanding to a panel of alumni.

The second core faculty member felt that the class session was a good beginning but expressed frustration that more was not being done with career advising and planning. He suggested expanding the seminar to include more career-oriented sessions. He thought the career handbook was an important component of the class session and was anxious to see all mathematics majors obtain a copy.

The instructor of the course who had not been involved with the project stated that the class was successful and the student response was more than he had anticipated. He seemed excited about the possibility of offering it again and expressed a desire to be more involved with developing a departmental career education program.

V. PHILOSOPHICAL AND OPERATIONAL CONCERNS

The philosophical problems that exist in implementing the career education concept within a liberal arts setting like the University of Denver are idiosyncratic to the very nature of the philosophy of American higher education - especially liberal arts.

The liberal arts philosophy traditionally has maintained a position of isolationism from the world of work. This is particularly apparent in many college curricula. However, the legacy of the 1970's to post-secondary education is the changing relationship between education and work. Such a legacy has provided the catalyst to begin the reform of higher education liberal arts programs from a posture of isolating education from the world of work toward a commitment to preparing students for life in a complex world. Career principles need not threaten the traditional view of a liberal arts education. The activities designed by the core faculty at the University of Denver during this first project year are evidence that liberal arts and career education can be successfully blended so that each enhances the other. Throughout the second and future years of the project, the impact of the programs developed as well as faculty and student attitudes towards the integration of academic and career principles will become increasingly important. The programs and attitudes will be evaluated to determine whether or not a true lasting fusion of academic and career education can be accomplished at the University level.

There are several reasons why this fusion is feasible in today's institutions of higher learning, such as the University of Denver, as opposed to the stance taken by higher education in the past. First, there is a much stronger student demand for this kind of integration in that more students are entering college with career goals in mind. Second, enrollment growth rates in the arts and sciences continue to decline. This, coupled with rising costs and rising attrition, is a concern of the faculty and the institutions. A successful academic/career education program provides assistance in emphasizing the meaning of a liberal arts education to the world of work. Third, the commitment made to students by faculty, as evidenced through teaching and academic advising programs, is attracting much attention. The blending of academic and career advising, then, is timely.

Although the integration of academic and career concepts within the liberal arts is possible, the philosophical resistance remains. The University of Denver core faculty were open to a discussion on career education by project staff, and no department denied entrance to the project staff or rejected concepts out of hand. The discussions were fruitful as evidenced by the programs developed and implemented. Questions on the balance of the concepts, the awarding of academic credit for career related topics, the impact on the curriculum were ever present. As the project procedes during the second and future years, these questions and others will continue to arise and be addressed. Philosophical resistance, therefore, is expected to mount as programs become more visable and career concepts disseminated to a larger academic constituency.

In addition to the philosophical problems, there were three main areas that created operational problems in introducing the career education concept within the liberal arts setting.

The first problem area centered upon heavy faculty work loads. At any given time, faculty were simultaneously involved in research, teaching, writing for publication, advising students, committee work, university governance, community relations, curriculum issues, and other services for students. All of these areas compete for attention. To complicate the problem at the University of Denver, the reward system for faculty (promotion, salary, tenure) is based upon research, publication and classroom teaching - not the development and implementation of the career education concept within the department. Such a system has a definite affect on a faculty member's time priorities.

The second problem area related directly to a time/schedule factor. The University of Denver operates on a quarter system. With the project beginning October 1st and the Fall Quarter ending mid-November, little time was available to initiate contact Fall Quarter. As a result project staff found themselves still working with faculty on contacts and program development Winter Quarter. This left Spring Quarter to accomplish most of the implementation. In addition, courses and faculty loads are determined by each department late in the Spring Quarter or early Summer for the following academic year. These deadlines added to the problems of insuring continuity the next year.

The difficulties created by internal department pressures and problems accounted for the third operational concern. Dealing with those departmental issues was a first priority with the core faculty and the introduction of the career education concept could only come after these pressures were either resolved or lessened.

VI. INSTITUTIONAL AND ORGANIZATIONAL MODIFICATIONS

Academic and Career Services

The University of Denver instituted a major organizational change in support of the academic/career education project during the first year efforts. The Career Planning and Placement Office was placed under the academic wing of the University reporting directly to the Vice-Chancellor for Academic Affairs. This structural change was designed to emphasize this institutions commitment to the integration of career and academic programs and to raise the awareness of the academic constituency as to the importance of the career professional in academia.

Although this administrative act was significant as an indication of support, true collaboration between academic personnel and career service staff does not immediately occur because of administrative dictum. The act itself, however, does establish the framework and gives focus for the development of integrated academic and career services.

The project staff and the Career Planning and Placement personnel met regularly to develop a plan for coordination of efforts and services. As a result of these meetings, Career Service staff participated in some of the activities developed by the Department of History, Political Science, and English. However, as these meetings progressed during the year, issues arose concerning the role of a career service unit within the academic arm of the university. The philosophical concerns which were voiced by the faculty over the balance of career principles within the liberal arts became apparent as a parallel issue among career service staff.

Campus career service units at many higher educational institutions, including the University of Denver, mainly, provide direct services to students in career planning and counseling. Since the departmentally based career education programs developed by project staff and faculty also provided career services to students, the traditional career service units were faced with the need to intensify their indirect services. Career service units consequently would function as a resource to deparmental career programs as well as maintain direct services to students. It is this balance between the indirect and direct that became the parallel issue.

Complicating the coordination efforts was the historical split between professional counseling and academic advising. At the University of Denver, academic advising is the responsibility of the faculty. Counseling, narrowly defined as personal or emotional assistance provided by trained professionals, is not viewed as part of the faculty/student advising exchange. Since the career service unit at the University of Denver houses counseling services, career planning activities are associated with counseling. As the departments developed programs such as the preparation of career handbooks to be disseminated to students during faculty advisement sessions, career planning also became part of academic advising.

Given that these issues are stated in simplified terms, the implications for continued efforts at addressing fundamental principles and traditional viewpoints are evident. During the second and future years of the University of Denver's academic/career education program, strategies and activities will be pursued that intensify the blending of academic and career service units.

University and Community Interaction

The departmental programs drew upon community resources to support their career efforts and to reinforce the university/community linkage. Since students continually move between the worlds of formal education and paid employment, project activities encouraged coordination and cooperation of both the educational and occupational communities.

The meeting held with community representatives and faculty from the departments of History and Political Science was an activity designed to increase collaboration. Members of the business, government, and non-profit community exchanged substantive content relating to career education and information regarding the obstacles and opportunities in career acquisition and advancement. They also provided consultation services to faculty for curriculum options. The faculty were able to share their views on the qualities attributed to liberal arts students completing a degree in their major disciplines and reinforce the relationship of academic preparation for career goals and adaptability.

Alumni from the surrounding community actively participated in course offerings in the classroom setting. Their perspectives on job entry and performance, choice of career paths, changing life styles, and academic preparation were a critical component of the class offerings developed by the Departments of English and Mathematics. Students involved in the Mass Communications seminar met with community representatives at the work setting to learn about various career avenues in order to begin making their career decisions.

The information provided by alumni over the past years through in-depth questionnaires such as those developed by the Departments of Mathematics and English and through career position and employer statements as utilized by the Departments of History, Political Science, Sociology, and Philosophy proved valuable for many activities.

Departments, such as Theatre, intend to make increased use of the surrounding community as a work-experience laboratory during the second year of the project to provide valuable career exploration opportunities for students.

Plans were developed for the establishment of a Community Board comprising various members of the business, labor, and government agencies to assist faculty and project staff with career programs. Actual implementation of such a Board is scheduled for the second year of the project.

Faculty Commitment and Curricula Modification

Since the faculty serves as the primary contact between student and university, and serves as the harbingers of educational reform, faculty must provide the basis of support for the meaningful integration of career concepts within the traditional liberal arts philosophy. The project staff focused their efforts towards introducing the concept of career education to faculty and in assisting them with the development and implementation of career oriented activities within the liberal arts. The faculty involved in the project were those that expressed an interest in career education and those holding "chairperson" positions. The activities designed illustrate the extent of awareness and commitment on the part of the core faculty. To help close the gap between the world of work and the liberal arts, all core faculty members of the university were encouraged to involve both the physical and personal resources of the business/labor/industrial community in expanding the content of the academic courses being taught.

During the second year of the project additional faculty members will join this core group and innovative faculty members, such as those interested in interdisciplinary courses, will be assisted to find ways of accomplishing the academic/career blend that enhances student's attempts to master the substantive content of the liberal arts courses. The operation of such an instructional system requires during the upcoming years, an expansion of effort, to involve members from the business/labor/industrial community. A major effort in liberal arts instructional modification will entail transforming work experience from a special kind of program available to only a minority of students to a general educational methodology available to all students during their stay at the institution. Students will rotate from one kind of work experience situation to another with the goal being truly one of career exploration within the liberal arts fields.

Individualization and modification of the liberal arts curricula then will continue to be supported through the faculty-based departmental programs. As a result of these academic/career programs, it is anticipated that many of the students graduating from the University of Denver will have had the opportunity to develop appropriate skills to integrate the world of work and the liberal arts in planning their own life long learning.

APPENDIX A

Havelock Model

Havelock Model
(Dissemination)

A key to the success of this diffusion effort will be the person who takes or is given responsibility for installing changes. Such a resource person has been called a change agent (e.g., see Havelock, 1973).[1]

The first faculty participants will be volunteers, i.e., they have expressed an interest in exploring work opportunities for the students majoring in their discipline.

The "spread-of-effect" approach described in this proposal as a slightly modified version of the basic process model developed by Havelock.

More specifically, the process which has evolved consists of four overlapping steps and require three weeks per cycle, during which time a change agent can rotate among two departments and provide a reasonably comprehensive program to both.

1. Demonstration and Discussion (1 week)

The training cycle is initiated with an individual meeting between the change agent (project staff member) and each of the two faculty members who are to be trained during that cycle.[2]

A major focus of the discussion is on learning the opportunities and resources for community and university involvement in the "world of work". Some meetings are scheduled with department faculty during the time and the change agents usually recommends a concise, relevant set of readings for the designated faculty volunteers.

---

[1] Havelock (1973) states that a change agent can act as: (1) a catalyst, (2) a solution giver, (3) a process helper, and/or (4) a resource linker. Focusing on the process helper role, he suggests that a "change agent's activity can be conceptualized into 6 stages. These are: I. Building Relationships, II. Diagnosis (From Pains to Problems to Objectives), III. Acquiring Relevant Resources, IV. Choosing the Solution, V. Gaining Acceptance, VI. Stabilizing the Innovation and Generating Self-Renewal.

[2] These meetings provide an important opportunity for the change agent to begin to build an effective working relationship with the participating teachers. Havelock (1973) suggests nine characteristics of such a relationship that "comprise an ideal base from which to launch an innovative process," i.e., reciprocity, openness (with 6 openness dimensions enumerated), realistic expectations, expectations of reward, structure, equal power, minimum threat, confrontation of differences, and involvement of all relevant parties.

2. Practice (1 week)

After approximately one week of demonstration and discussion the designated faculty members begin to apply what has been learned within the department or school. This application will be both at the resource identification and program planning and implementation level.

Clearly, then steps 1 and 2 overlap; this blending of one step into the next is important at each transition point in the process.

3. Initial Implementation (1 week)

(Close collaborative relationship between the "supervisor" and the "supervised" devoted to mutual sharing and problem solving rather than to critique.)

4. Follow up - The change agent (Project Staff) should be available as often as possible to answer questions, solve problems, etc. In practice, it has been found that such support is needed mostly in the first month after completing the third step, and that this can be handled by setting aside 1 day a week for such consultation.[3]

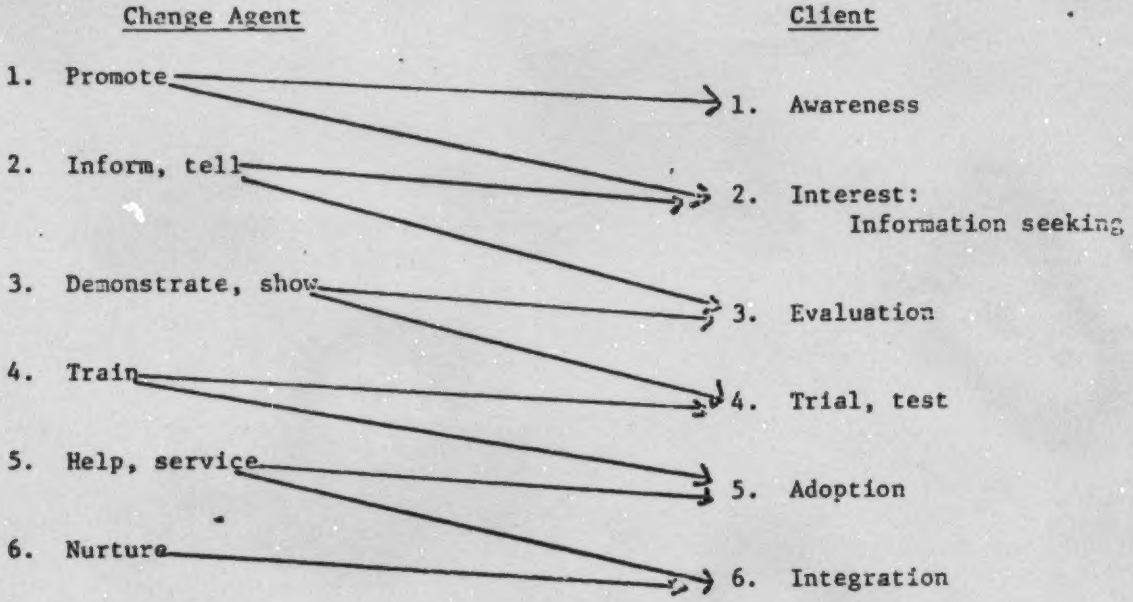
The "anchor" member of the other department or school learns to act as a facilitator (on-site change agent) by participating in the process, i.e. observing practicing, discussing, observing and so forth.

In connection with the above procedures, it is interesting to note that in his book, The Change Agent's Guide to Innovation in Education, Havelock (1973) summarizes six research-identified phases in the process of individual adoption of an innovation. These are: awareness, interest, evaluation, trial, adoption, and integration. He then indicates that the change agent's activities should be designed to coordinate with these six phases, i.e., be designed so that the change agent is with (not ahead or behind) the individual adopter. Thus, he suggests the process occurs in the following way (see Havelock, 1973, p. 115):

---

[3] Havelock (1973) stated: "The key work in insuring continuance is 'internalization.' Where possible, the change agent should lead the client toward self-help and responsibility in the maintenance of the innovation. There are at least six important considerations in insuring continuance. These are: 1. continuing reward, 2. practice and routinization, 3. structural integration into the system, 4. continuing evaluation, 5. providing for continuing maintenance, 6. continuing adaptation capability."

Coordinating Change Agent Activities with the Client's Adoption Activiti



Change Agent	Client
1. Promote	1. Awareness
2. Inform, tell	2. Interest: Information seeking
3. Demonstrate, show	3. Evaluation
4. Train	4. Trial, test
5. Help, service	5. Adoption
6. Nurture	6. Integration

Havelock, 1973

APPENDIX B

Mathematics/Computer Science Alumni Questionnaire

MATHEMATICS/COMPUTER SCIENCE
ALUMNI
QUESTIONNAIRE

1. (a) Did you receive a BA or BS in mathematics from DU? Yes or No

   (b) If so, in what year? ____________

   (c) Did you take the computer science option? Yes or No

2. (a) Did you receive a graduate degree from DU? Yes or No

   (b) If so, which degree and what year was it awarded?

	Year
MA/MS in mathematics	________
MS in computer science	________
PhD in Mathematics	________

3. How do you rate your education in mathematics at DU?

Excellent Good Fair Poor Terrible NOT APPLICABLE

4. How do you rate your education in computer science at DU?

Excellent Good Fair Poor Terrible NOT APPLICABLE

5. How do you rate your overall education at DU?

Excellent Good Fair Poor Terrible

6. What did you like best about your experiences in mathematics/computer science at DU? (Note: You might wish to mention courses, teachers, books, schedules, advising, degree requirements, atmosphere, classrooms, red tape or what-have-you.)

____

____

____

7. What did you like least about your experiences in mathematics/computer science at DU? (Note: See note in 6. above.)

____

____

____

8. Employment History (in chronological order, i.e., first job first)
Note: Include graduate education not at DU.

	Years	Employer	Job Title or Description
(1)			
(2)			
(3)			
(4)			
(5)			
(6)			

9. For each of the jobs above, how important was your mathematics/computer science education at DU in helping you get the job?

(1)	Extremely	Significantly	Somewhat	Not Much	Not at All
(2)	Extremely	Significantly	Somewhat	Not Much	Not at All
(3)	Extremely	Significantly	Somewhat	Not Much	Not at All
(4)	Extremely	Significantly	Somewhat	Not Much	Not at All
(5)	Extremely	Significantly	Somewhat	Not Much	Not at All
(6)	Extremely	Significantly	Somewhat	Not Much	Not at All

10. For each of the jobs above, how important was your mathematics/computer science education at DU in helping your performance on the job?

(1)	Extremely	Significantly	Somewhat	Not Much	Not at All
(2)	Extremely	Significantly	Somewhat	Not Much	Not at All
(3)	Extremely	Significantly	Somewhat	Not Much	Not at All
(4)	Extremely	Significantly	Somewhat	Not Much	Not at All
(5)	Extremely	Significantly	Somewhat	Not Much	Not at All
(6)	Extremely	Significantly	Somewhat	Not Much	Not at All

11. Add here any COMMENTS you might wish to make

____

____

____

____

____

____

____

____

____

____
NAME (OPTIONAL)

REQUEST FROM YOU TO US

A. Please send me the Mathematics Department's 1976-77 Annual Report ____

B. Please send me the College's Priorities Committee Report. ____

C. Please place me on the mailing list for the Conference on Computing in the Undergraduate Curriculum to be held at DU next June. ____

D. Please send me a summary of the results of this questionnaire. ____

If you have checked any of the four boxes above, then clearly you can no longer remain anonymous. Please give us your name and address -- or at least an address.

____
Name

____
Street

____
City, State

MATHEMATICS/COMPUTER
ALUMNI QUESTIONNAIRE

730 questionnaires sent, 186 returned = 25½%

1&2.Number of respondents by year of graduation:

YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER	YEAR	NUMBER
1934	1	1950	3	1960	6	1969	11	not given	3
35	1	51	7	61	7	70	9		
39	1	52	4	62	5	71	9		
40	1	53	6	63	6	72	5		
41	2	55	2	64	10	73	13		
44	1	56	3	65	9	74	4		
46	4	57	3	66	6	75	2		
47	2	58	6	67	7	76	7		
48	5	59	2	68	6	77	1		
49	6								
totals	24		36		62		61		3

Total number of respondents	186	
Number of BA/BS degrees (only)	119	1 Graduate with no math degree.
Number of BA/BS and grad. degrees from DU	36	
Total number of graduate degrees (no undergrad DU)	62	
MA/MS	59	
Phd	3	

Number taking computer science option:

1965-197[illegible]	23
1970-1977	22

3. Question: How do you rate your education in mathematics at D.U.?

excellent	49
excellent to good	3
good	96
fair	7
poor	1
terrible	1

4. Question: How do you rate your education in computer science at D.U.?

After and including 1965

excellent	5
excellent to good	1
good	17
fair	7
poor	1
terrible	1

5. Question: How do you rate your overll education at DU?

excellent	40
excellent to good	3
good	110
good to fair	2
fair	21
poor	2
terrible	1

6. Best liked experiences at D.U.:	number of times mentioned
a. Atmosphere	10
small classes	10
small, informal, relaxed (other words used)	
b. Teachers	11
student/faculty relationships	18
interest in/caring for students	13
competence	5
grad. advising	6
role of secretary	1

Specific names given

Hoffman	31
Dorn, Bardwell, Recht	8-12

(mentioned 4 or less)
Stearns, Martin, Prather, Gudder, Warren, Noble, Lewis, Moore, Bartlett, Smith, Brunte, Ritter, Hagin, Hector, Wise, Humphries, Beck, Rasmussen, Burroughs, Greenberg, Werchoff, Hebel, Bleistein, Skelton, LaVita, March, Jauch, Thant, Cohen *

c. Program	number of times mentioned
rigor	1
good course selection	1
flexible	4
engineering/math mix	2
creative approach to problem solving	6
continuity	1
specific courses:	
computer science	6
calculus	5
diff. equ.	3
machine language	3
computer work	2
number theory	3
statistics	2
probability	2
astronomy	2

others mentioned only once
digital planning, systems programming, numerical analysis, topology, physics, trig., cobal prog., func. analysis, methods of math. sci., intro. to comp. prog., linear algebra, applied math, math lab.

d. Miscellaneous:	
involvement with DRI	1
GTA	3
excellent library	1
"the men students"	1

* Cohen not identified by first name

7. Question: Least liked experiences	number of times mentioned
a. Limited and inadequate course offerings (1934-70 grads)	32
b. Inadequate facilities (1950-69 grads)	5
c. Academic and Career advising	12
d. Curricular items, department's orientation to teachers and engineers (1950)	1
e. attendance requirements	1
f. too expensive	1
g. failure in a class	2
h. assistance from computer center	4
i. non-academic environment	2
j. Red tape of registrar's office	1
k. Courses:	
math, topology, geometry, probability, linear algebra, theory of automation, abstract algebra (mentioned once).	
calculus	2
diff. equ.	2
non math courses	2
l. Teachers:	
classes taught by non-regular personnel; such as GTA, visiting profs.	5
Ritter	2
Noble in infinite SC	1
Dept. Chairman after Rasmussen	1
Knowledgeable prof. Knew little about teaching techniques	1
m. GRE exam	1
late afternoon classes	1
inadequate night courses	1
night courses	1
8 a.m. classes and lab	1

8. See separate report..

9. *Importance of mathematics/computer science in getting the job:

	years 77-70	years 69-65	years 64-34
extremely	28	20	70
significantly	32	37	85
somewhat	17	29	66
not much	12	11	29
not at all	25	20	46

10. *Importance of mathematics/computer science in job performance:

	years 77-70	years 69-65	years 64-34
extremely	15	23	73
significantly	35	30	91
somewhat	31	34	68
not much	14	9	34
not at all	21	18	30

*Alumni rated "importance" to each job held; see separate report for details

MATHEMATICS/COMPUTER SCIENCE

ALUMNI QUESTIONNAIRE

November 22, 1977

Undergraduate Degree

Ability Rating 1 —/ 3 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF THE JOB
Hughes Aircraft	MTS Programmer	significant	extremely
Univ. Colo	Grad School MA	extremely	significant
----------	Math Teacher	significant	extremely
Univ. Colo	Ed. Dept Staff	not much	somewhat
76 Ridge HS	Math teacher	significant	extremely
Stanford U.	Grad. Student,	somewhat	somewhat

Assessment: rating 1.	getting a job	performance on job
extremely	1	3
significant	3	1
somewhat	1	2
not much	1	0
not at all	0	0
no answer	0	0

Graduate Degree

Ability Rating 1 / 6 alumni			
EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE ON THE JOB
Univ. Washington	Grad Student	significant	significant
Tulane U.	student	extremely	significant
Georgetown U.	Asst Prof	somewhat	significant
District 6	HS Math teacher	extremely	extremely
Mo. So. St. Coll.	Asst. Prof. Math	extremely	extremely
US Bureau of Mines	Mathematician	significant	somewhat
US Bureau of Reclamation	Computer Spec.	significant	somewhat
Hughes Aircraft	MTS Prog.	significant	extremely

Assessment; Rating 1	getting a job	performance on job
extremely	3	3
significant	4	3
somewhat	1	2
not much	0	0
not at all	0	0
no answer	0	0
Graduate Degree		

Undergraduate Degree

Ability Rating 2 / 4 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF JOB
Stanford U.	Surgical Res.	not at all	not much
Bell Labs	Software Eng.	extremely	somewhat
Colo. Univ.	Student MA	somewhat	not much
Walt Flanagan & Sons	Statistician	somewhat	not at all
Stop and Shop	Industrial Eng.	not much	not at all
Stop and Shop	Systems Analy.	not at all	not at all
Boston U.	Comp Sc MAS	not much	not at all
Entrex Inc	Systems Prog.	not at all	not at all
Phillips	Budget Analy	extremely	significant
R. ATRW, Inc.	Tech Staff	somewhat	somewhat
Congress. Budg Off.	Budg. Analy	significant	significant

Assessment: rating 2	getting a job	performance on job
extremely	2	0
significant	1	2
somewhat	3	2
not much	2	2
not at all	3	5

Graduate Degree

Ability Rating 2 / 4 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE ON THE JOB
DPS	Math Teacher	extremely	significant
U. Rochester	grad student	extremely	significant
Argonne Math Lab.	Physicist	not much	somewhat
Naval Weapon Center	Mathematician	significant	extremely
Boeing Aerospace	Spec & Eng.	significant	significant
Martin Marietta	Prog. Analy	extremely	significant
Systems Consultants	Sys. Analyst	significant	significant
Forestry Service	Computer Spec.	significant	significant

Assessment: Rating 2	Getting a job	performance on the job
extremely	3	1
significant	4	6
somewhat	0	1
not much	1	0

Undergraduate Degree

Ability Rating 3 / 18 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF THE JOB
Western Electric	Sys. Programmer	extremely	not at all
Uinv. Colo	Grad Student MBA	no answer	no answer
LTV RDI	Waitress	not at all	somewhat
1st Nat. Fairbanks	Bookkeeper	not much	significant
W.R. Grace	Geologic Asst.	extremely	extremely
CIA	Trajectory Anal.	no answer	no answer
Vetro Labs	Mathematician	no answer	no answer
Xibucxm Inc	Proj Mgr Sr Pr. analy.	no answer	no answer
Park School	Math Teacher	significant	significant
Johns Hopkins U student	Civil Eng.	somewhat	somewhat
DeLeuw Cather & Co	Track Struct. En	extremely	extremely
Univ. Colo. student	Computer Sc. MS	Significant	significant
Gen. Automation	Programmer	not much	somewhat
Autotral	Mgr Sys. Prog.	not at all	not much
DPS	Math Teacher	extremely	significant
DPS	Math Teacher	extremely	extremely
USAF	Egress Sys. Rep.	not at all	not at all
Burger King	Op. Mgr	somewhat	somewhat
Shell Oil Co	Prod. Eng.	Significant	significant
Ladd Oil Co	Prod Eng	significant	significant
Ladd Oil Co	Div. Eng.	significant	somewhat
Univ. Denver	sys. Anal/prog.	no answer	no answer
Thomas Jeff. Life	Sys Anal/Prog	no answer	no answer
HS	Math Teacher	significant	significant
Harper College	Instructor	significant	significant
DPS	Math Teacher	extremely	extremely
Jeff Co	Sub. Teacher	significant	extremely
Univ. Utah	Research Assoc & TA	extremely	extremely
Burroughs	Sr. Syst. Rep.	extremely	not much
Purdue U.	Math Student MS	no answer	no answer
Purdue U.	Instructor	no answer	no answer
Purdue U.	Adm. SP Center Prog. Asst. Dir.	no answer	no answer
Indiana U.	Instructor	no answer	no answer
Univ. Cinn.	Student Col.Law.	no answer	no answer
Ford	Procedures Anal	extremely	somewhat
Midas Int. Corp	Sr. Syst. Anal	extremely	somewhat
Barton Brands Inc	Sr. Mgr	significant	somewhat
Xerox	Proj Mgr	somewhat	not much
Xerox	Info Sys Consult to all Latin Am Affiliates	somewhat	not much
IBM	computer sales	extremely	significant
Tech Pub.	Mktg RA	significant	not much
Pine Grove Rest	Waitress	not at all	not at all
....	Construct. labor.	not at all	not at all
....	Geometrics Surv. Field Inst. Pers.	not much	somewhat
Thunderhead Inn	Reserv. Clerk	not at all	not at all

CONTINUED

Undergraduate Degree

Ability Rating 3 / 18 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF THE JOB
Western Electric	Sys. Programmer	extremely	not at all
Uinv. Colo	Grad Student MBA	no answer	no answer
LTV RDI	Waitress	not at all	somewhat
1st Nat. Fairbanks	Bookkeeper	not much	significant
W.R. Grace	Geologic Asst.	extremely	extremely
CIA	Trajectory Anal.	no answer	no answer
Vetro Labs	Mathematician	no answer	no answer
Xibucxm Inc	Proj Mgr Sr Pr. analy.	no answer	no answer
Park School	Math Teacher	significant	significant
Johns Hopkins U student	Civil Eng.	somewhat	somewhat
DeLeuu Cather & Co	Track Struct. En	extremely	extremely
Univ. Colo. student	Computer Sc. MS	Significant	significant
Gen. Automation	Programmer	not much	somewhat
Autotral	Mgr Sys. Prog.	not at all	not much
DPS	Math Teacher	extremely	significant
DPS	Math Teacher	extremely	extremely
USAF	Egress Sys. Rep.	not at all	not at all
Burger King	Op. Mgr	somewhat	somewhat
Shell Oil Co	Prod. Eng.	Significant	significant
Ladd Oil Co	Prod Eng	significant	significant
Ladd Oil Co	Div. Eng.	significant	somewhat
Univ. Denver	sys. Anal/prog.	no answer	no answer
Thomas Jeff. Life	Sys Anal/Prog	no answer	no answer
HS	Math Teacher	significant	significant
Harper College	Instructor	significant	significant
DPS	Math Teacher	extremely	extremely
Jeff Co	Sub. Teacher	significant	extremely
Univ. Utah	Research Assoc & TA	extremely	extremely
Burroughs	Sr. Syst. Rep.	extremely	not much
Purdue U.	Math Student MS	no answer	no answer
Purdue U.	Instructor	no answer	no answer
Purdue U.	Adm. SP Center Prog. Asst. Dir.	no answer	no answer
Indiana U.	Instructor	no answer	no answer
Univ. Cinn.	Student Col.Law.	no answer	no answer
Ford	Procedures Anal	extremely	somewhat
Midas Int. Corp	Sr. Syst. Anal	extremely	somewhat
Barton Brands Inc	Sr. Mgr	significant	somewhat
Xerox	Proj Mgr	somewhat	not much
Xerox	Info Sys Consult to all Latin Am Affiliates	somewhat	not much
IBM	computer sales	extremely	significant
Tech Pub.	Mktg RA	significant	not much
Pine Grove Rest	Waitress	not at all	not at all
....	Construct. labor.	not at all	not at all
....	Geometrics Surv. Field Inst. Pers.	not much	somewhat
Thunderhead Inn	Reserv. Clerk	not at all	not at all

CONTINUED

Undergraduate Degree

Assessment: rating 3	getting a job	performance of job
extremely	11	6
significant	11	9
somewhat	3	10
not much	3	4
not at all	6	5
no answer	11	11

Graduate Degree

Ability Rating 3 / 5 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE ON THE JOB
IBM	Computer Mktg	extremely	significant
Sudan Government	HS. Teacher & Asst. Lecturer	extremely	extremely
DRI, DU	Programmer	extremely	significant
Deer Trail School	HS Math Teacher	somewhat	not much
Colo Nat. Bank	Op. Officer.	significant	significant / somewhat
DPS	Math Teacher	significant	extremely

Assessment: rating 3	getting a job	performance on job
extremely	3	2
significant	2	3
somewhat	1	1
not much	0	1
not at all	0	0

Undergraduate Degree

Ability Rating 4 / 12 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF THE JOB
PPG Industries Inc.	Sys. Analy	significant	not at all
Rever Elec Sup.	Inside sales	no answer	no answer
Cutler Hammer	Sales Eng.	no answer	no answer
DRI	RA	not much	significant
Falcon R&D	RA	no answer	significant
Chrysler	Math Analy	somewhat	somewhat
Philco Ford	Sys. Anal. Proj.	somewhat	significant
Lockheed	Sys Anal Proj	somewhat	somewhat
Delanese Corp	Sys Anal Proj	somewhat	somewhat
So. Tex. Col. Law	Student JD	somewhat	somewhat
Ch. of Redeemer	Bookkeeping Cord.	not at all	somewhat
Pub. Serv. Co.	Jr. Prog Anal	significant	extremely
EMR Computer	" " "	significant	significant
Control Data Co	" " "	somewhat	significant
West Publishing Co	" " "	not at all	somewhat
Bache & Co	Sales	not at all	somewhat
1st Hawaiian Bank	Systems Anal	somewhat	significant
Bishop Trust Co	Mktg Off.	not at all	somewhat
Denver Fed. Center	Math Instructor	not at all	not at all
DPS	Math Instructor	significant	somewhat
Community Coll. Denver	Math Instructor	extremely	significant
Weld Co. School	sub. Teacher	significant	significant
Woodward Gov. Co	Accts Rec.	significant	somewhat
King Soopers	checker	not at all	not at all
Husky Oil Co	Asst. Cr. Rep	significant	somewhat
DPS	Math Teacher	significant	extremely
US Defense Mapping	Mathematician	significant	significant
US Env. Pro. Agy.	Systems Analy	significant	somewhat
Univ. Va.	student MBA	no answer	no answer
....	Math Teacher	significant	significant
Scientific Software	programmer	significant	significant
US Army	Mathematician	extremely	significant
Burroughs	Systems Analy	significant	significant
West Coast U.	Student MS	no answer	no answer
DPS	Sub Teacher	extremely	somewhat
Cork and Cleaver	Waitress	not much	not at all
Univ. Colo	Student	not much	somewhat
Coopers: Lybrand	CPA	not much	somewhat
De Paul U.	student	not much	somewhat
Dist. 6	math teacher	extremely	significant
Irwin Mgt. Ct.	RA	significant	somewhat
Muncie Ind. Sch.	Math Teacher	extremely	significant
Ball State U.	student MA	no answer	no answer
North Miami Sch.	Math Teacher	extremely	significant

Undergraduate Degree

Assessment: rating 4	getting a job	performance of job
extremely	8	1
significant	13	18
somewhat	8	18
not much	4	0
not at all	5	2
no answer	6	5

Ability Rating 4 / 3 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE ON THE JOB
Tetra Tech Inc	Sr Syst Analy	no answer	no answer
TRW Inc	programmer	no answer	no answer
Martin Marietta Corp.	Engineer	no answer	no answer
Jeff Co schools	secondry. Teach	somewhat	significant
Metro St.	P/T Inst.	significant	significant
IBM	Comp. Sales	extremely	significant

Assessment: rating 4	getting a job	performance of job
extremely	1	0
significant	1	3
somewhat	1	0
not much	0	0
not at all	0	0
no answer	3	3

Graduate Degree: SPECIAL

Ability rating 4 / 1 almuni			
EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE ON THE JOB
Chicago Pub. Sch	Math Teacher	somewhat	not at all
Amer. Hosp Sup	Mktg Asst.	not at all	not at all
US. Army	Personal Spec	extremely	not at all
Aetna Life	ActuarialAsst.	significant	significant

Assessment: rating 4-special	getting a job	performance of job
extremely	1	0
significant	1	1
somewhat	1	0
not much	0	0
not at all	1	3
no answer	0	0

Undergraduate Degree

Ability Rating 5/ 5 alumni

EMPLOYER	POSITION	ASSESSMENT IN GETTING A JOB	ASSESSMENT IN PERFORMANCE OF JOB
AMSCO Div	Sales Trainee	somewhat	somewhat
AMSCO	Sales Mgr	no answer	no answer
AMSCO	Sr. Salesman	no answer	no answer
AMSCO	Nat. Acct. Rep	no answer	no answer
AMSCO	Area Mgr	no answer	no answer
Honeywell	Programmer	extremely	extremely
Honeywell	Proj Mgr.	not at all	not at all
Honeywell	Natl Acct Pro. Mg.	not at all	not at all
Lockheed Mis. & Sp.	Programmer	significant	significant
GE	Syst. Analy	significant	significant
Gates Rubber Co	Proj Mgr DP	somewhat	somewhat
Martin Marietta	Math Analy	significant	extremely
Fontana Media Co	Pres. Gen Mgr Radio Sta.	not much	somewhat
Gulf Oil Co	Computer Analy	somewhat	somewhat
Republic Nat Bank	Sr. Prog	not at all	not at all
S. W. Bell	Sr. Analy	not at all	not at all
McDonnell	Prog. Super Auto.	not at all	not at all
F&M Inc	Sys Analy	not much	somewhat

Assessment: Rating 5	getting a job	performance on job
extremely	1	2
significant	3	2
somewhat	3	5
not much	2	0
not at all	5	5
no answer	4	4

APPENDIX C

Department of Mathematics Career Handbook

A GUIDE TO

CAREERS IN MATHEMATICS
AND
COMPUTER SCIENCE

University of Denver

1978

CONTENTS

Page Number

CAREERS IN MATHEMATICS AND COMPUTER SCIENCE---1

CAREER LEADS------------------------------------2

Hiring Institutions-----------------------2

Positions---------------------------------3

Summary of Alumni Opinions----------------3

JOB SEARCH--------------------------------------3

Making Contacts-Department----------------4

Making Contacts-Professional Associations-4

Resources---------------------------------5

Work Experience---------------------------5

GRADUATE SCHOOL---------------------------------6

CAREERS IN MATHEMATICS
and
COMPUTER SCIENCE

The purpose of this handbook is to provide mathematics and computer science students with some suggestions about career opportunities and procedures for actively pursuing a job area of interest. The faculty is dedicated to providing a total educational background that will serve as a base from which you will enjoy challenging and rewarding careers in mathematics and computer science. Hence, this handbook consists of an overview of the kinds of positions held by our alumni, suggestions for exploring career alternatives while you are a student, a discussion of graduate education, and the role of professional organizations in the lives of mathematicians and computer scientists.

> "Mathematics is not only a useful tool for the physical, social, behavioral and business sciences, it is an important subject in its own right."

> "Business, industry and government rely heavily upon analysis for decision making."

Mathematics majors are probably aware of the accuracy in these general statements. Diverse use of mathematical and computing skills and development of analytical thinking are, for the most part, the basic reasons for choosing mathematics as a major. However, these statements begin having specific meaning in exploring career alternatives for math majors. They become very real by looking at positions held by alumni.

CAREER LEADS

In 1977, the Department of Mathematics sent a questionnaire to alumni asking about their educational experience at D.U. as it related to their careers. Respondents were asked about the positions they've held since graduation, employing companies, and opinions of the educational experience in getting and advancing in their career field.

Hiring Institutions.

The following list is selected to provide an idea of the scope of business, agencies, and firms which employ mathematicians.

PRIVATE INDUSTRY

HONEYWELL
BELL LABS
ENTVEX INC
VETRO LABS
TWC INC
BOEING AEROSPACE
REVER ELECTRIC SUPPLY
GENERAL ELECTRIC
GATES RUBBER CO
WESTERN ELECTRIC
HUGHES AIRCRAFT
XEROX
LOCKHEED
MIDAS INT. CORP
GENERAL AUTOMATION
MARTIN MARIETTA
BARTON BRANDS INC.
PPG INDUSTRIES, INC.
CUTLER HAMMER
FALCON R&D
DELANESE CORP.
WEST PUBLISHING CO.
BACHE & CO.
FORD
DE LEUU CATHER & CO.
FIRST NATIONAL BANK
THOMAS JEFFERSON LIFE INS.
AETNA LIFE
COOPERS:LYBRAND

GOVERNMENT RELATED

U.S. BUREAU OF MINES
NAVAL WEAPONS CENTER
U.S. BUREAU OF RECLAMATION
CIA
U.S. FORESTRY SERVICE

ENERGY RELATED

LADD OIL CO.
SHELL OIL CO.
HUSKY OIL CO.
PHILLIPS
PUBLIC SERVICE CO. OF COLORADO

COMPUTING*

CONTROL DATA CO
BURROUGHS
IBM

EDUCATIONAL INSTITUTIONS

PUBLIC SCHOOL SYSTEMS
PRIVATE AND PUBLIC INSTITUTIONS
OF HIGHER EDUCATION

The above are hiring institutions reported by alumni. Others, such as the National Center for Atmospheric Research, Geological Survey, Colorado State Government, Marathon Oil, also hire mathematics and computer science majors.

* Computing positions are also available with most of the companies listed in other categories.

Positions

From an overview of employers, the next question is; What kinds of positions are held in these companies? The following list suggests the scope of positions held by mathematics majors who hold a degree from D.U.

- MATHEMATICS TEACHER-ELEMENTARY
- MATHEMATICS TEACHER-SECONDARY
- MATHEMATICS TEACHER-COLLEGE AND UNIVERSITY
- GRADUATE RESEARCH ASSISTANTS
- BUDGET ANALYST
- BOOKKEEPING COORDINATOR
- MARKETING RESEARCH
- MARKET RESEARCH ANALYST
- MARKETING ASSISTANT
- STATISTICIAN
- ACTUARIAL ASSISTANT
- SALES ENGINEER
- OPERATIONS MANAGER
- PROGRAMMER
- SCIENTIFIC CONSULTANT
- SYSTEMS ANALYST
- MATH TECH. AID
- COMPUTER SALESMAN
- SALES
- TRAJECTORY ANALYST
- NAVAL ANALYSIS
- MEDICAL RESIDENT

From a total of 147 positions held, 42 positions related to Computer Science; such as, computer programmer, systems programmer and systems analyst.

Thirty four respondents entered the field of education with 18 teaching positions in elementary and high school, 7 in colleges and universities, and 9 received graduate teaching assistantships. The survey showed 24 positions in university research and teaching positions.

Summary of Alumni Opinions

The following statements summarize the opinions of alumni regarding the relevance of their education for entering their career fields and performance on the job.

Small classes, the informal and relaxed atmosphere were liked best. Good course selections, creative approach to problem solving and flexibility were seen as factors contributing to a positive educational experience. In terms of specific courses, computer science and calculus were mentioned as being among the most valuable experiences. More than half the graduates from 1970-77 indicated that the mathematics/computer science program was extremely or significantly important in getting their job.

JOB SEARCH

An overview of alumni careers is useful to students to the extent that it identifies specific career alternatives. However, such an overview should not suggest a total range of career possibilities. There are various ways of making contacts which lead into these and other careers.

Making Contacts-Department

Possibly the most available contacts are faculty members in the math department. Employing institutions often use the department as a resource for identifying potential employees. Let the chairperson know your interests and abilities and that you're looking for a position.

FIELD	FACULTY CONTACT PERSON
energy related	Dr. Joel Cohen
government related	Dr. William Dorn
computer science	Dr. Ronald Prather
statistics	Dr. George Bardwell
education	Dr. Ruth Hoffman
graduate school	Dr. Stanley Gudder

Making Contacts-Professional Associations

Attending meetings of professional associations is another way of making contacts leading to career opportunities. Your professional growth begins while you are a student. Meeting with mathematicians or computer scientists who are outside academia and exchanging ideas with them provides opportunities for growth through dialogue on issues and concerns related to professional values and skills. As a student now and in a career later, these relationships provide a concept of the ever-increasing scope of math-related enterprises. The relationships also provide a common base of support for mathematical scientists engaged in diverse individual careers.

The following is a list of professional organizations and meetings.

ASSOCIATION FOR COMPUTING MACHINERY (ACM)
The Rocky Mountain Chapter generally meets once a month in the evening with a technical talk preceded by dinner.

SIGSCI-A special interest group of the ACM in scientific computing. Generally meets every other month with a talk on a specific area related to the science of computing. Meetings are followed with lunch.

SIGNUM-A special interest group of the ACM in numerical analysis. Generally meets every other month with a talk on a specific area related to mathematics theory. Meetings are followed with dinner.

MATHEMATICS ASSOCIATION OF AMERICA (MAA)
Rocky Mountain Section meets once a year in April, usually in Colorado. The 1977 meeting was in Denver. Two days of technical talks.

Other national organizations occasionally have their annual meetings in Denver. For example,

The International Solar Energy Society will meet in Denver in August 1978 and the National Conference on Computers in the Undergraduate Curriculum will be held at D.U. in June 1978.

Feel free to contact Dr. William Dorn for arrangements for a ride and companionship to the meeting you wish to attend. Or, feel free to go alone. As a math major your attendance is welcomed.

Resources

Along with attending professional association meetings, it's important to become acquainted with journals. Particularly when the real crunch of a job interview is imminent, it's helpful to be familiar with the current ideas and issues related to a profession. The faculty recommends the following journals and books. They are available in Penrose Library and in the career library located in Woodstock Lounge.

AMERICAN MATHEMATICAL MONTHLY
COMPUTING SURVEYS
COMMUNICATIONS OF THE ACM
SIAM (Society for Industrial & Applied Mathematics) NEWSLETTER
SIAM REVIEW
MATHEMATICAL REVIEWS
COMPUTING REVIEWS
DATAMATION

Another resource is the Office of Career Planning and Placement. The following is a brief outline of the services available to D.U. students and alumni through that office.

1. Counseling on career plans and goals.
2. Assistance in job search techniques such as resume writing, interviewing and locating job openings.
3. On-campus interviews with prospective employers.

For more information about these services and for participation in the programs, call or come to the Career Planning and Placement Office, Columbine East, Room 125, X3511.

Work Experience

Entering a new career with work experience may enhance your chances for employment in a chosen field. There are opportunities for gaining some experience while you are in school.

1. Cooperative education programs are offered through a joint arrangement with the College of Arts and Sciences and the Career Placement Office.

2. Internship programs are available in the math department.

3. Part-time and summer employment opportunities are available. See Dr. Dorn in the department or Mr. Clements, Mary Reed Bldg., Room 222.

GRADUATE SCHOOL

For some students the career plan includes graduate school. Advanced study may be an immediate goal or a goal to be achieved after a period of work experience. The alumni reported entering graduate schools not only for advanced degrees in mathematics, but also in related fields, e.g., physics or engineering. Others used the undergraduate math major as a background for professional training in law and medicine.

Before making decisions about graduate education, have a candid talk with your advisor to assess your potentials for advanced level studies. Your advisor can also provide information about various programs which are additional to material found in graduate school bulletins and catalogues available at Penrose Library.

Although variations are found in graduate school programs, some requirements are common to most of them.

1. Admission usually requires a bachelor's degree, satisfactory score on the Graduate Record Examination, and at least a 3.0 grade point average in undergraduate course work.
2. The course of study requirements often include advanced level mathematics courses, advanced level courses in other fields, reading competency in a language and an independent research project.
3. Teaching assistantships and research assistantships are usually available through the department on a highly selective basis.

For information about these options, the math department of a specific school should be contacted.

APPENDIX D

Department of English Alumni Questionnaire

UNIVERSITY OF DENVER
An Independent University
University Park, Denver, Colorado 80208

Department of English / 303•753-2266

March 22, 1978

Dear Alumnus/Alumna:

The University of Denver has received a Federal Government Grant to examine the relationship between undergraduate Arts and Science disciplines and alumni careers.

The Department of English is one of the few chosen to poll alumni in order to find out whether course work in the Department did indeed prepare students for future careers. Of course, it could be argued that course work in English is not primarily intended to prepare majors for work in later life. But we feel that there ought to be some connection between the two, and that faculty should be aware of the demands placed on alumni once they take employment after their undergraduate training.

We hope you will take a few minutes to fill out the enclosed questionnaire and return it to us. We would appreciate this very much.

Yours sincerely,

Peggy McIntosh Eric Gould

Peggy McIntosh and Eric Gould
Directors of Undergraduate Studies

cjp:PM/EG

THE UNIVERSITY OF DENVER IS AN AFFIRMATIVE ACTION INSTITUTION

APPENDIX E

Department of History Career Handbook

A GUIDE TO
CAREERS IN HISTORY

University of Denver

1978

CONTENTS

Page Number

I. WHAT CAN I DO WITH A HISTORY MAJOR?-----------1

  A. The Historian as a Generalist.------1

  B. Fields Closely Related.-------------2

  C. Teaching.--------------------------2

  D. Researching and Writing.------------3

II. HOW CAN I PREPARE?----------------------------3

III. WHO IS GOING TO HIRE ME?---------------------3

IV. HOW DO I GET THE JOB?------------------------4

V. ADDITIONAL INFORMATION.-----------------------4

CAREERS IN HISTORY

I. WHAT CAN I DO WITH A HISTORY MAJOR?

You can research and write history, teach history, do work in a closely related field, or apply the historian's general skills in a wide variety of careers. Relatively few jobs will require you simply to research and write history. As you venture farther from this core of the historians craft you will find increasing numbers of jobs. Historians are above all generalists;. The French historian Marc Bloch characterized history as "the most difficult of all the sciences" because its subject was man-not just economic, or political, or aesthetic man-but man in all his aspects and activities. The habit of grasping for the whole picture, of accepting bewildering complexity over tidy simplicity--these generalists skills and habits of mind are an excellent, although not always sufficient, preparation for many careers.

A. The Historian as a Generalist

As a history major you have learned, or will learn, to find information, to assess evidence, to analyze, to draw conclusions, and to present your results in clear, forceful writing. To your analysis you can bring the advantage of historical perspective. A recent survey of history majors graduating between 1972 and 1977 revealed the career choices of 112 graduates, some of which are set out in the following table.

Business	21
Teaching (Elem. & Second.)	10
Sales	9
Law	8
Insurance	8
Public Service	7
Banking, Finance, Brokerage	6
Advertising, Marketing	5
Librarian, Archivest	4
Medicine	3
Applied research	2
Journalism	2
Ministry	2
Advocacy organizations	2

Excluding teaching for the moment, by far the greatest numbers of D.U. history graduates have gone into law and general business, with significant numbers going into insurance, retail sales, advertising and marketing, and banking and finance.

Public agencies look for many of the same qualifications valued by private employers. Many agencies are heavily involved in social research. Much of the research involves large numbers of subjects, and a knowledge of statistics and computer programming will be helpful. Public administrators are expected to have broad, general skills and knowledge as well as specialized preparation. The PACE examination, given twice a year, recruits candidates with general, liberal arts backgrounds for many careers in the federal civil service..

√

Your general skills of analysis and presentation are a good foundation for careers in all of these fields; in some cases such as journalism and government they may be sufficient qualifications for entry level positions. In every case, course work particularly related to your chosen career will give you a competitive edge. For some careers, such as law, additional education beyond your bachelors degree is essential.

B. Fields Closely Related to History

Historians are commonly hired to work in archives, museums, historical societies, in historic preservation and as editors in publishing houses. In all these fields, there will be some positions available to candidates with a bachelors degree in history. In all of them, some special course work preparing you for that field will be a great asset. An employer may then hire you for your broad mastery of historical skills, expecting to train you for your particular work, while feeling sure that there are tasks you can begin immediately without lengthy orientation. Special course work in addition to your major is an indication to an employer of your interest. You have chosen his field rather than simply casting around for "something to do with a history major". Courses in librarianship, art history, archaeology, architecture or mass communications are an effective supplement for those seeking to enter these fields. To be candid, in our age of specialization, a masters degree seems increasingly to be required for entry into many of these fields.

C. Teaching

Teaching history will probably have come readily to mind. At a University you will be expected to pursue research and publish your results as well as to teach. A four year college will require more teaching and may place less emphasis upon research. A doctorate is essential for college and university teaching and will usually require a minimum of four years of additional study after your bachelors degree. Such positions are relatively scarce and competition is extremely keen.

If teaching history appeals to you more than research, a position at a junior or community college may interest you. Your teaching load will be heavier than at a college or univeristy, but you will not be expected to do research. A masters degree requiring 1 to 2 years of study is generally sufficient qualification for such a position. Indeed many junior and community colleges may be less ready to hire you if you have a doctorate. Some states require Certification as well.

You may teach history at the high school level with no more than your bachelors degree. Unless you teach at a private school, however, you will need to take education courses to prepare you to be certified by the state in which you will teach. History at the secondary level is often taught as part of social studies and your preparation whould include such areas as political science, economics, sociology, and anthropology as well as history.

Any member of the history faculty will be glad to discuss a career in teaching with you. For secondary level teaching you will want to discuss your interest with someone in the School of Education as well.

D. Researching and Writing

Relatively few jobs will require you simply to research and write history. Most Federal agencies maintain an office responsible for the agency's history and some positions will be available in research projects funded by public agencies or private foundations. A bachelors degree will qualify you for some of these positions, but many will require an advanced degree or experience. Most employers will ask you to apply your skill of historical inquiry to some practical task or to perform services in addition to research.

II. HOW CAN I PREPARE?

Early investigation into fields of interest to you will allow you to plan your course of study effectively. Some kind of related on-the-job experience prior to graduation will be of great help in demonstrating to potential employers your interest and aptitude in your field. This will be particularly true if you intend to look for a job immediately after receiving your bachelors degree, but many graduate school admissions committees will also be favorably impressed. Work study, cooperative education, internships, and volunteer work all offer you the chance to add experience to your academic qualifications.

Members of the history faculty can advise you in your choice of fields, schools, and programs. You should not hesitate to approach faculty of the university's many other departments and professional schools for advice about their fields. They in turn will often be able to refer you to professionals in your proposed career in the Denver area, many of them D.U. graduates. You will find that most people, even if approached "cold" without an introduction, will be glad to share their experience with you.

III.WHO IS GOING TO HIRE ME?

The Career Planning and Placements Office can provide you with information on particular employers and specific job openings. If you have identified a particular career that appeals to you, it will be worthwhile to acquaint yourself as thoroughly as possible. A knowledge of the particular qualifications currently in demand will allow you to shape your program accordingly.

Most professionals will be members of an association which publishes a journal, newsletter, or job bulletin. Student or associate memberships are often available at greatly reduced rates. Membership will not only bring you a stream of useful information but will demonstrate your involvement to potential employers. If you are interested in a career in historical research, teaching,or closely related fields you should consider membership in the American Historical Association. Its Employment Information Bulletin is the most complete national listing of job opportunities for historians. If you are considering junior or community college teaching, you will want to consult the publication of the Association of Community Colleges as jobs at this level are rarely listed in the Employment Information Bulletin. The Bulletin will inform you in deatil of the historical areas and methodological specialties for which a demand exists.

IV. HOW DO I GET THE JOB?

The Career Planning and Placements Office has many kinds of assistance for you in learning to prepare resumes, conduct interviews, and manage your candidacy. Workshops, written guidelines, and mock interviews which may be video-taped will give you a chance to perfect these skills. Career Planning and Placement is located in Columbine East, room 125.

V. ADDITIONAL INFORMATION

Most professional associations and many institutions concerned with history publish directions of employees, training programs, and members. Many have special publications intended to explain opportunities available for historians. Three of these, through which you may contact many more, are listed below with their addresses. The Office of Career Planning and Placement will be able to direct you to more.

American Association for State and Local History
1400 8th Ave South
Nashville, Tennessee 37203
"So You've Chosen to Be a History Professional"

Office of the Doctoral Project
New York State Education Department
99 Washington Ave Rm #1942
Albany NY 12230
"Non-Academic Careers for Historians"

American Historical Association
400 A Street SE
Washington, D.C 20003
"Careers for Historians" $2.00

APPENDIX F

"Introduction to Undergraduate English Studies: Career Advising"

Syllabus

12-117 INTRODUCTION TO UNDERGRADUATE ENGLISH STUDIES: Career Advising

1:00 P.M. Wednesday GCB 146 McIntosh and Gould

22 March: MLA Booklet: "English: Preprofessional Major."

29 March: Preprofessional major.

5 April: Prospects in Publishing: representative from Viking/Penguin Press

12 April: Selling your talents: Vita Preparation and Interviewing.

19 April: Employment with the Federal and State Governments: Civil Service rep.

26 April: Prosepcts in the Foreign Service: G.S.I.S.

3 May: The State of Graduate Studies in English

10 May: Librarianship.

17 May: General requirements for the business world.

24 May: Law

A number of students have already enrolled for this course, but we want to emphasise that others not taking it for credit may attend any or all of the meetings.

The colloquium is designed to cover a range of topics related to the usefulness of English as a major. The class will be visited by speakers offering information and first-hand experience. There will be time for argument and discussion. And, of course, your advisor is always available to follow up further questions you may have.

Peggy McIntosh
Eric Gould

APPENDIX G

Survey Instrument and Analysis

CAREER ADVISING COLOQUIUM
DEPARTMENT OF ENGLISH
SURVEY INSTRUMENT

	not at all	somewhat	very much
1. This course stimulated my thinking about a variety of career options.	________	________	________
2. I learned about career possibilities in my major field which I had not known about before this course.	________	________	________
3. This course helped me to make a career decision.	________	________	________
4. The professors presented the material in an organized, understandable, and interesting manner.	________	________	________
5. Alumni and other members of the business community presented information about their career field clearly and candidly.	________	________	________
6. Representatives from graduate schools presented information about graduate education clearly and candidly.	________	________	________
7. Would you recommend this course to other students?	________	________	________

8. List the type of information that was:

A. Most helpful ____

B. Least helpful ____

C. Could have been omitted ____________________________________

D. Needs to be added ____

9. The main reason I participated in this course was: ______________________

0. Comments: (please use reverse side)

ENGLISH SEMINAR EVALUATION SUMMARY

Total N = 10

	Not at all	Somewhat	Very Much
1. This course stimulated my thinking about a variety of career options.		3	7
2. I learned about career possibilities in my major field which I had not known about before this course.		3	7
3. This course helped me to make a career decision.	4	6	
4. The professors presented the material in an organized, understandable, and interesting manner.		4	6
5. Alumni and other members of the business community presented information about their career field clearly and candidly.		1	9
6. Representatives from graduate schools presented information about graduate education clearly and candidly.	1	5	4
7. Would you recommend this course to other students?			10

8. List the type of information that was:

A. Most helpful:

Details on how to get unobtainable job and other job opportunities - 2

Interview techniques - 1

Resume preparation - 4

Informative speakers - 8 (especially govt., law, publ.)

Relationship of classes taken to job - 1

B. Least helpful information:

Information from grad school - 5 (especially Librarianship and International Relations)

C. Could have been omitted:

Information from Librarianship and International Relations - 4

D. Needs to be added:

Advertising, Journalism - 4
Public Relations - 3
Media Related Enterprises - 6
Communications - 2
Other - 1

9. Main Reason Participated:

- wanted to learn more about choices for English majors and jobs - 6
- wanted some direction to help plan curriculum for remaining years at school
- felt career education important to be implemented in a liberal arts education

10. Comments:

- other students from other majors said would like a similar course
- entire seminar most encouraging in developing skills and job possibilities
- valuable and should be continued
- helpful and thought provoking
- enlightening about career opportunities
- optimistic approach
- although initially skeptical - proved to be excellent

PARADOXES AND POTENTIAL FOR CAREER EDUCATION IN HIGHER EDUCATION

Kenneth B. Hoyt
Director, Office of Career Education
U.S. Office of Education

Introduction

The immediate need for and potential of effectively delivering career education in higher education is greater than at any other level of American education. Yet, the acceptance and implementation of the career education concept has been slowest at the higher education level. It is the purpose of this paper to present one view of why this has occurred and to suggest a series of action steps for consideration by the higher education community.

Many of the thoughts included in this paper were obtained from participants in three OCE "mini-conferences" conducted during the 1976-77 academic year. Two of these involved persons engaged in career education efforts at publically supported State colleges and universities. The third involved a number of professional associations in higher education including the American Association of State Colleges and Universities. Notes from the entire series of 10 "mini-conferences" have been published by and are available, in limited quantity, from OE's Office of Career Education under the title CAREER EDUCATION MINI-CONFERENCES FOR POSTSECONDARY PRACTITIONERS. While some of what I learned from the participants will be related here, I do not, of course, want them to be held responsible for these remarks.

In order to set the stage for these remarks, I would like to begin by noting a number of paradoxes that seem to be contributing to the problem.

Remarks prepared for presentation at the 3rd National Career Education Conference of the American Association of State Colleges and Universities. Detroit, Michigan. March 10, 1978.

Following this, I would like to discuss the problem in terms of what I see as its four major elements; namely (a) students; (b) administration; (c) staff; and (d) faculty. Necessarily, a discussion involving this many sub-parts means that each can be mentioned here only in brief outline form.

Paradoxes Facing Implementation of Career Education in Higher Education

Several things strike me as odd when I consider the problems involved in implementing a career education effort in higher education. While I have labeled them here as "paradoxes," you may feel more comfortable thinking about them as "hunches," "hypotheses," or simply as "random thoughts." My "random thoughts" on this subject include the following:

1. It strikes me as unfortunate that one of the apparent inevitable results of emphasizing the importance of protecting the individual faculty member's right to change rapidly is an increase in the difficulty of obtaining institutional change. It seems paradoxical that, the more we seek to protect the right of the individual faculty member to change, the less likely we are to be able to move toward overall institutional change.
2. It strikes me as paradoxical that, as the evidence mounts demonstrating the intense interest of college students in readying themselves for work, there has been no corresponding rise in interest and/or action on the part of colleges and universities.
3. It seems paradoxical that, on many college campuses today, there exist closer working relationships between staff persons and members of the broader community than between staff persons and members of the teaching faculty.

4. It seems paradoxical that one of the most appropriate ways for higher education to respond to pressures for a greater emphasis on the goal of education as preparation for work is to respond by emphasizing the multiple goals of higher education. It will certainly be a paradox if one of the major contributions career education makes to higher education is to bring about a re-awakening and an added emphasis on goals of higher education other than that of education as preparation for work.

5. It strikes me as paradoxical that, as higher education institutions worry more and more about obtaining alumni support, they seem still to be reluctant to utilize alumni as resource persons in career education efforts.

6. It seems paradoxical to me that, while the current rapid increase in continuing education efforts of higher education is increasingly directed toward a career emphasis, there appears to be no corresponding increase in a career emphasis for the undergraduate programs.

7. It seems paradoxical to observe the sizeable resistance to career education coming from members of the liberal arts faculty when, in actuality, a career education emphasis could easily become one of their strongest rationales for existence. 7

8. It strikes me as paradoxical to observe that, as the need for collaboration in career education becomes increasingly obvious, the response of many institutions of higher education seems to move in the opposite direction by creating still more competing programs.

9. It seems paradoxical to observe that, while persons from the broader business/labor/industry community are becoming increasingly involved in many college program operations, there has been no systematic effort to use their involvement as a stimulus for institutional change.

10. It seems paradoxical that philosophical statements of goals and objectives appearing in college catalogues seem to be read more frequently by parents and the general public than by members of the teaching faculty.

While these apparent "paradoxes" may seem to you to be either non-existent or easily explainable, I have a hunch that they are very real in the minds of many influential members of the general public. Rather than enumerate more here, it seems more fruitful to turn now to a discussion of various elements within higher education that must be considered in making decisions relative to the need for and applicability of the career education concept to higher education.

The Student Body

It seems to me easy to defend a contention that today's college students desire, need, are ready for, and have many natural environmental opportunities to benefit from career education if such an emphasis were placed in higher education.

The desire of today's college students for greater assistance in readying themselves for work is evident in a wide variety of documents known to this audience and requires no documentation here. The existence of that desire was emphasized by almost every participant in the "mini-conferences" referred to earlier. Whether this desire is a function of an increasing sense of seriousness of purpose among today's college youth, a function of their realization of current troubles facing college graduates in the occupational society, or some combination of such factors could be debated. The presence of the desire is, in my opinion, real and not subject to needed debate.

The need of college students for greater career assistance is equally obvious. It can be seen in statistics regarding both employment and underemployment problems facing today's college graduates. The November, 1977, issue of MONEY magazine reported BLS statistics indicating that, of the 10 million college graduates expected during the next decade, approximately 2.5 million--one out of every four--faces the prospect of underemployment. Problems of moving up in today's occupational society are becoming as great for college graduates as problems of gaining entry into that society. Like the desire of college students for career assistance, the need of assistance is so obvious as to almost be beyond debate.

Similarly, the readiness of college students for assistance in career planning and decision making is clear and apparent. Such students possess several natural advantages over students in the K-12 school system including: (a) they are, by and large, further advanced in career maturity and readiness for career decision making; (b) they are almost all old enough so as not to be hampered by child labor laws in seeking work experience in the broader community; (c) they are relatively more free than high school students in terms of flexibility in their class schedules so can arrange different hours for work experience; and (d) they are more acceptable to employers as part-time employees and as persons seeking career exploratory experiences than are younger students from the K-12 school system. These, and other factors, make problems of arranging career education experiences for college students a manageable task.

In short, it seems safe to conclude that the probable receptivity of college students to a career education emphasis appears high. It would be extremely difficult to defend a contention that today's college students do not desire, need, or are not ready for such an emphasis. Those who care about the college student must surely today have some interest in applying the career education concept to higher education.

Administrators in Higher Education

The need for "support from the top" seems to be a necessary, though not a sufficient, condition for implementing change in any organization. While this concept may be somewhat more questionable in the case of higher education institutions than for many other kinds of organizations, it is certainly not inoperative. Yet, among experts from higher education who have consulted with OE's Office of Career Education, one of the most frequent observations has been that this kind of top-level administrative support for career education is apparently lacking on many college and university campuses.

Several suggestions for overcoming this difficulty have been offered including the following. First, university administrators today are frequently asked to expand the scope of persons served by higher education to include adults as well as youth. A career education emphasis in higher education is one possible approach for doing so--especially with respect to problems of mid-career change and re-entry into the labor force being sought by many women in today's society.

A second suggestion often made is to utilize the interest of influential "thought leaders" in the State to motivate top-level college and university administrators to give serious consideration to career education--including persons from both the State legislature and from the business/labor/industry community.

Third, several persons have suggested that an announced career education emphasis may, in these times, be an effective means of recruiting recent high school graduates to the campus. Given the demonstrated current high interest in career education concerns voiced by today's youth, this suggestion appears to be a reasonable one. There is some evidence, in selected institutions, that it has proven to be effective.

Fourth, some OCE consultants have hypothesized that, if a bonafide career education emphasis existed on the campus, the college dropout/stop-out rate may well be reduced. This, too, may prove helpful to the institution from both a financial and from a public relations standpoint.

Fifth, to install a career education effort on a college or university campus demands, among other things, the coordination, if not the consolidation, of several kinds of existing student services. Such an action could well prove to be a cost effective action on the campus.

Finally, several have suggested to OCE that some top-level college and university administrators may be favorably inclined toward career education's emphasis on involvement of alumni in career education efforts, both in terms of public relations benefits and because of the potential for increasing alumni contributions to and interest in their alma mater.

If such suggestions are followed, OCE consultants tended to agree they may encourage top-level college and university administrators to: (a) voice their philosophical support for career education; (b) re-allocate some currently existing funds to the career education effort; (c) move toward reorganizing student services in ways that improve the effectiveness of career education; and (d) encourage mid-level administrators (i.e., deans and department heads) to lend their support to career education. Such actions are not yet commonplace.

Non-Academic Staff Members in Higher Education

Most colleges and universities currently have a number of non-teaching elements in existence that could easily be re-structured in ways that improve the effectiveness of career education. The two major generic kinds of problems existing are: (a) encouraging such units to work collaboratively rather than independent of or in competition with each other;

and (b) encouraging greater interaction between such elements and members of the teaching faculty.

One example is seen in the recruiting-admissions-counseling-financial aids-placement operations within higher education. If viewed from a career development standpoint, there is good reason for putting these student services (if not more) under one administrative structure. Of all such units, the one that needs and deserves the greatest increase in emphasis at the present time, in my opinion, is the college placement office. This is true both because of the "bottom line" implications of the tasks assigned the placement office and because of the rich reservoir of community resource persons that could be generated from existing contacts in the professional placement offices. If a career education reorganization were to take place, it would surely recognize the placement function as a developmental process that begins with the admissions office and continues through the student's academic life at the institution. Professional placement personnel have routine contacts with employers from the business/industry/government/professional community in both on-campus and in off-campus settings. Such contacts could surely be utilized far more extensively and effectively than they typically are at present for such purposes as participating in the career counseling process and in serving as resource persons to members of the teaching faculty. Both the status and the importance of the college placement office on most campuses need, in my opinion, to be greatly strengthened.

The alumni office on any campus certainly holds high potential for interesting and involving alumni in an institutional career education effort. Responses from alumni will provide valuable data to both students and faculty who ask what one can do with a major in a particular field. Alumni who are now active members of the occupational society can be extremely valuable career education resource persons on the campus--and it is not difficult to interest them in doing so. Finally, alumni can and should be used much more than they currently are on many campuses as aids in placing current students in part-time jobs and graduates in full-time employment.

The domain of experiential education--including cooperative education, work experience, and experiential learning programs--should become an integral part of a career education effort in higher education. The major problem is one of shifting the perspective of all involved from one of viewing such efforts as small programs serving relatively small numbers of students to one of viewing them as a form of educational methodology that could, and should, be applicable to most curricula of the institution and made available to most, if not all, students. Using various forms of student work experience programs for career exploration is fully as important as using them for purposes of making money available to students. Using experiential learning as a supplement to cognitive learning is fully as important as using it as a substitute for cognitive learning. Like the placement function, the general domain of experiential learning with all of its subparts is an area that needs and deserves far greater emphasis on the college and university campus than it currently typically enjoys. Similarly, contacts between persons responsible for such programs and members of the teaching faculty need to be greatly increased. Where a comprehensive career education effort exists, this will occur.

The Academic Faculty and Career Education

Finally, any discussion of career education in higher education must include a discussion of the critical role of the teaching faculty in career education. No matter how much student services are strengthened or changed, until and unless the teaching faculty becomes involved, it seems to me difficult to defend a contention that career education is really "in place" in a given institution of higher education.

-The sources of resistance to career education, or almost any other form of educational innovation, can be summarized easily as follows:

1. Most faculty members do not understand the concept and are not easily motivated to learn about it through traditional faculty meetings. The term "faculty development" is regarded, by the typical faculty members, as an individual matter of personal choice, not something carried out in group settings in meetings called by college administrators.
2. To many members of the academic faculty, the goal of education is simply education--i.e., the purposes that motivate the student to learn the subject matter and the uses made by the student of the subject matter are not matters of primary concern to the faculty member.

3. The high degree of autonomy afforded individual faculty members, so necessary to protection of academic freedom, acts as a most effective deterrent to widespread institutional change. Only two basic avenues exist for use in motivating the individual faculty member to change: (a) to convince him or her that, unless change occurs, the faculty member's status and/or position may be threatened; or (b) convince him or her that there is something positive to be gained from changing. Of these two basic avenues, the second is far preferable to the first.
4. Faculty members tend to feel a higher loyalty to their particular academic discipline than to the employing institution. Thus, their tendencies to change are governed relatively more on the basis of what is the perceived direction of and benefits for the discipline than any perceived concern for the goals and welfare of the institution.

Faced with such problems, participants in the OCE "mini-conferences" whom I referred to earlier made several positive action suggestions aimed at solving them, including:

1. Recognizing that the survival of Assistant Professors is heavily dependent on production of scholarly work within their specialty and, recognizing further that many who have attained the status of full Professor may be disinclined toward change, concentrate on trying to influence Associate Professors to study and learn about career education through a series of subsidized seminars where the participating faculty members will be paid for learning. It was suggested that foundation funds may be available for such purposes.

2. Organize "faculty development" programs around sabbaticals in the broader occupational society for individual faculty members. Such experiences, subsidized by the business/industry community, could help faculty members learn how graduates use what they teach and motivate faculty members to place a greater emphasis on education as preparation for work.
3. With the help of the alumni association and the college placement office, encourage individual faculty members to follow up their majors in order to discover the occupations they actually follow. Such data may encourage many faculty members to use resource persons from the business/industry community in their classes to discuss career implications of current majors with students.
4. Demonstrate, using interested faculty, how a "careers" emphasis on the part of a given discipline or department within the institution may encourage more students to enroll as majors. The "students voting with their feet" approach may encourage other professors and departments to adopt a similar approach.
5. Encourage faculty members to work collaboratively with those staff persons in experiential education to combine a "learning to do" with a "doing to learn" approach to mastery of the subject matter. If such a procedure involves occasional visitation on the part of the faculty member to an actual work site for purposes of verifying or assessing academic competence, this may encourage a greater "career education" emphasis in the teaching/learning process.

6. Encourage faculty members to discover the ways in which students may use undergraduate majors in the occupational society. One of the obstacles to be overcome is the assumption held by many faculty members who teach undergraduate students that the prime use to be made of the undergraduate degree is to gain admittance to graduate school. The statistics on the oversupply of persons holding advanced graduate degrees are impressive and readily available for use in encouraging individual faculty members to consider this option.

7. Make a special effort to encourage liberal arts faculty members to learn about and appreciate the vital contributions liberal arts education makes to education as preparation for work. The need for true liberal arts education at upper management levels in the occupational society is easy to document. So, too, are the contributions of true liberal arts education to helping the individual humanize the workplace for himself or herself. Similarly, the contributions of liberal arts education to helping the individual find a humanistic meaning of work in productive use of leisure time are matters easily explained and readily accepted by liberal arts faculty members. If, simultaneously, the institution voices a commitment to providing students with a true liberal arts education--i.e., with more than a simple collection of liberal arts courses--members of the liberal arts faculty may be more favorably inclined toward embracing the career education concept.

It will not be easy, nor will it be quick, to convince members of the teaching faculty to embrace the career education concept or to participate in implementing a career education effort in higher education. Still, the institution that fails to make this a matter of high priority stands little chance of ever meeting the career education needs of its students.

Concluding Remarks

This paper has obviously been oriented much more toward pragmatic goals than toward philosophical considerations. This emphasis has been purposeful and reflects my feeling that practical suggestions are more needed today than philosophical arguments. As a result, these remarks will undoubtedly appear to many to represent oversimplified generalizations rather than thoughtful deliberations. I would hope that some might discern that the generalizations made here are, in fact, based on some careful thinking. I hope they may be helpful to those higher education institutions now considering the career education concept.

You will note that, nowhere in this discussion, have I mentioned the possibility of Federal financial aid to institutions of higher education for use in initiating career education efforts. This has been purposeful on my part because, at this point in time, there is no absolute assurance that such Federal assistance will be forthcoming. I hope that your interest in and concerns regarding career education are not necessarily dependent on the presence or absence of such aid.

SOME THOUGHTS ON CAREER EDUCATION AND THE LIBERAL ARTS

Kenneth B. Hoyt
Director, Office of Career Education
U.S. Office of Education

Introduction

Vocationalism and the liberal arts are frequently pictured as having opposing value bases. The career education concept represents an attempt to bring vocationalism and the liberal arts together in a compatible conceptual framework. In so doing, this concept has pictured the liberal arts as having significant positive contributions to make toward attainment of the goal of education as preparation for work. If fully implemented, it is my contention that the career education concept will enhance, not detract from, the importance of the liberal arts in higher education.

To defend this contention demands that career education be conceptualized in such a way that make logical connections among a number of facts which, when combined, appear on the surface to be lacking in logic. The facts to which I refer include such bits of information as the following:

1. A record number of persons will graduate from college in 1978.[1]
2. The most frequently given reason for attending college given by entering freshmen is to ready themselves for employment.
3. There are predicted to be approximately one million more college graduates during the period 1974-85 than jobs requiring college degrees.

---

[1] Projections of Educational Statistics - 1985-86. Washington, D.C. National Center for Educational Statistics, 1977.

* Paper prepared for presentation at Emanual College, Boston, Massachusetts. October 22, 1977

There are three sub-topics to be considered here. First, the goals of career education must be clarified. Second, the topic of the liberal arts as preparation for work must be discussed. Finally, a few comments are in order with respect to career education, as one of a number of change alternatives, currently available to higher education.

Goals of Career Education and Higher Education

The Cooperative Institutional Research Program, University of California, recently published results of a survey entitled "The American Freshman: National Norms for Fall 1976."[2] This survey included responses of 215,890 freshmen entering 393 colleges and universities in 1976. Under "reasons noted as very important in deciding to go to college," 71.7% of the freshmen in the sample listed "able to get a better job." This was the reason most often checked. Next was "learn more about things" and third was "able to make more money." There can be little doubt but that entering college freshmen place a high value on the goal of education as preparation for work.

Career education is, in part, an effort to make education as preparation for work an important goal of higher education institutions so that student goals and institutional goals are more compatible in nature. For those higher education institutions who value this goal, career education asks that this value be translated into specific action commitments. Such actions include: (a) an emphasis by the teaching faculty on ways in which their efforts will help meet this institutional goal; (b) a concentrated campus-wide emphasis on providing opportunities for career development assistance to all students; and (c) an emphasis on involving the business/labor/industry community in institutional efforts to attain this goal. The specific methods and procedures advocated by career education have been documented elsewhere and need not be repeated here.[3]

---

[2] Austin, A.W., M.R. King, and G.T. Richardson, The American Freshman: National Norms for Fall, 1976. Los Angeles: Cooperative Institutional Research Program of the American Council on Education and the University of California at Los Angeles, 1976.

A second part of the career education effort is to improve the appropriateness of meaning of the goal of education as preparation for work in higher education institutions. Career education asks that this meaning be extended considerably beyond the traditional interpretation of providing students with specific vocational skills required for entry into the occupational society. In addition to this traditional emphasis, the career education concept calls for attention to providing students with the means to: (a) change with changes in the occupational society; (b) move up and advance in the occupational society after having gained entry into it; (c) humanize the work place for themselves over and beyond any humanizing efforts made by the occupational society itself; and (d) make unpaid work, as well as paid employment, a meaningful and productive part of the individual's total lifestyle. In each of these four ways, the career education concept represents an expansion of goals far beyond those traditionally associated with what has been known as "vocationalism."

---

[3] Hoyt, K. Application of the Concept of Career Education to Higher Education: An Idealistic Model. Washington, D.C.: U.S. Government Printing Office, 1976.

The Liberal Arts as Preparation for Work

I saw recently a quote attributed to Dr. Allan Ostar, Executive Director of the American Association of State Colleges and Universities in which he said:

> Corporate presidents go around making lovely speeches written by Ivy Leaguers about the value of a liberal arts education, but somehow don't communicate these views to their personnel departments doing the hiring."[4]

Some conjecture appears to be in order relative to the possible dynamics involved in providing an explanation for this situation.

First, the question may be asked, "What are the specific vocational skills imparted by the liberal arts?" A different, but equally intriguing question is, "What would lead an employer to hire a liberal arts graduate over a non-liberal arts graduate in these times?" Both questions become appropriate to ask when one considers recent BLS estimates that, during the period 1974-1985, a total of 13.1 million college graduates will be competing for 12.1 million jobs requiring a college education.[5] Like most futuristic estimates, some error is undoubtedly involved. In spite of this, I am convinced that there is good reason to believe that these estimates possess a considerable degree of validity.

To consider these questions in the narrowest sense, one could simply point to the fact that the liberal arts are designed to transmit to students knowledge regarding the basic nature and values of the culture--and that, obviously, the nature of work and work values are a part of the contents of the liberal arts. In terms of process, as opposed to content, goals, the liberal arts are designed to provide students with skills to think—to think logically, to think philosophically, to think scientifically, to think creatively, to think analytically, and to think retrospectively. Such skills are undeniably "vocational skills" in that they are the ones most needed and utilized in making basic policy decisions both in the occupational society and in the larger society. The corporate presidents Ostar refers to are persons for whom such vocational skills are of paramount importance in performance of their daily tasks. It is little wonder that they value them.

---

[4] "A Surplus of Grads" Washington Post, August 21, 1977.

[5] Baxter, Neale, "Payoffs and Payments: The Economics of a College Education." Occupational Outlook Quarterly, 1977, 21, No. 2, 28-33.

Second, it seems important to recognize that the vocational skills imparted through the liberal arts are valued much more highly at top levels of the occupational society than at what has come to represent entry-level employment opportunities for recent college graduates. At the entry level, employers seem to value specific vocational/technical/professional competencies related to occupational productivity defined in the narrow terms of a particular job or position. Faced with a surplus of college graduates, it is not surprising that personnel managers tend to hire those who can contribute most directly—and in the shortest possible time—to organizational productivity.

Third, to carry this point one further step, there appear today to be many jobs requiring a college degree where the specific vocational skills of the liberal arts graduate may well be considered more of a liability than an asset. That is, the ability to think—in more than a mechanistic sense—is actually discouraged in many jobs new college graduates find today. The ability to think, as a specific vocational skill, appears to be more highly valued and utilized as one moves up the occupational ladder. Perhaps this is what has caused some to claim that the liberal arts college prepares its graduates for their second, third, or fourth jobs, not for those they first find after graduation. While this logic appears sound, it is equally logical to point out that the person who has not found a "first" job cannot, by definition, find a "second" one. It seems to me inevitable that today's liberal arts graduates must, somewhere in their college experience, accumulate some specific vocational skills valuable for gaining entry into today's occupational society. Such skills can be considered over and beyond skills imparted by the liberal arts designed to enable them to advance and move up in that society.

Fourth, there are three eminently practical benefits to be gained by those who acquire the vocational skills imparted through a liberal arts education. They include: (1) liberal arts skills will be valuable assets in gaining advancement in the occupational society; (2) liberal arts skills will be useful, even in the most menial of jobs, in efforts of the individual to humanize the workplace for herself or himself--i.e., to develop a sense of meaningfulness and purposefulness in the work activities that extend beyond the simple routine tasks to be performed; and (3) liberal arts skills will be of great use to the individual in developing and implementing a total lifestyle that includes ways of making productive and satisfying use of leisure time. The liberal arts are at least as "practical" today as they have ever been in the past. An appropriate interpretation of meaning of the goal of education as preparation for work in these times must recognize and embrace the values of a liberal arts education.

The Challenge for Change: Implications for Liberal Arts Education

Faced with the three conditions outlined at the beginning of this presentation, it seems apparent that some change is called for on the part of higher education. That is, it seems indefensible to continue recruiting college freshmen knowing their primary motivation for college attendance is preparation for work and knowing further that many of them will find themselves either unemployed or underemployed upon graduation from college. To continue college recruiting efforts while ignoring these conditions is unfair to both the students being recruited and to the larger society. Yet, on many college campuses, this, in effect, appears to be what is happening. The time for change has come. Here, four possible basic approaches--including career education--will be considered.

One direction that could be legitimately taken would be that of placing major emphasis on goals of higher education that extend beyond simply that of education as preparation for work. In effect, this would necessitate a campaign aimed at convincing the approximately 70% of today's entering college freshmen that they are wrong in placing their top priority on the goal of education as preparation for work. By ignoring this goal, the college could concentrate on other goals of higher education that have important lifestyle implications. Such an approach would lend both legitimacy and credence to current actions aimed at increasing campaigns aimed at attracting more students to the campus. A few colleges appear to be currently moving in this direction. This strategy, however, does not appear at this time to represent any kind of national trend.

A second basic direction in which American higher education could move, in attempting to recognize and act on predictions of surplus college graduates for the number of job openings, would be to reduce the number in ways that correspond more nearly to demands of the occupational society. This could be accomplished, of course, by such means as: (a) raising admission standards; (b) raising course standards; and/or (c) emphasizing to prospective college students that, if they seek specific vocational skills for use in entering today's labor markets, there are many alternative forms of postsecondary education that they should consider--i.e., by actively discouraging persons who express interest in college attendance. Again, while a few institutions appear to be moving in this basic direction, there is certainly no evidence that it is a national trend.

Were this approach to be adopted, it could be defended, in a democratic society such as ours, only on the basis of a concern for improving the quality of American higher education--not on a pure "matching persons and jobs" basis. There seems little doubt that, whether or not these means are the ones utilized, an active and concerted effort aimed at improving the quality of American higher education--and particularly the quality of liberal arts education--is sorely needed. In the case of the liberal arts specifically, I, for one, do not believe that liberal arts education can be effectively carried out through mass instruction calling for large class size. To teach so-called "liberal arts courses" by means of large classes and utilizing junior staff members can, in no way, be pictured legitimately as providing a "liberal arts education." To teach students to think, in my view, calls at a minimum for small classes, for instructors who themselves have ample time and the ability to think, and for the concentrated use of both oral and written communication as vehicles for helping students learn to think. Liberal arts education cannot be mass education. It has been both false and dangerous to assume that liberal arts instruction is less expensive than technical or professional education. It may well be, if done right, more expensive. The need for a return to true quality liberal arts education is, in my opinion, both strong and convincing.

A third possible basic approach to change in American higher education would be to reverse the traditional ordering of emphasis on liberal arts education as opposed to professional/technical education. I am not thinking here of simply placing the so-called "professional specialization" portion of the undergraduate degree at the Freshman/sophomore levels and the "liberal arts education" portion at the junior/senior level. Rather, I am thinking of a change that would lead to professional specialization courses occupying most of the undergraduate curriculum with an increasing emphasis on liberal arts education at the graduate—or at least post-baccalaureate--level.

The rationale behind such a change is obvious. Several years ago, employers were, in effect, saying to colleges and universities: "Give us graduates with a broad liberal arts education who can think clearly and constructively.

We will provide them with the specific vocational skills they need in an on-the-job manner." Today, employers responsible for the actual hiring of recent college graduates seem to be saying: "Give us persons with specific vocational skills as well as liberal arts skills. If you do, we will find workers who are both immediately productive and, in addition, capable of moving up in our organization." It seems obvious that, to whatever extent being "capable of moving up in our organization" becomes a bonus long run side-effect rather than an operationally important hiring criterion, the importance of the liberal arts as preparation for work will be under-emphasized.

The potential dangers of this third approach are obvious. If carried to an extreme, it would mean an increased emphasis on those institutions concentrating major attention on supplying students with specific entry-level vocational skills and a corresponding de-emphasis on liberal arts institutions of higher education. If this were to happen, those liberal arts colleges that survived might well find themselves concentrating primary attention on providing employed workers who are candidates for middle and upper management positions with liberal arts education. At its ultimate extreme, this direction could lead to employers saying to colleges: "Give us the person with specific vocational skills required for job entry and we will give them a liberal arts education through on-the-job training"—an exact reversal of earlier times! While obviously not likely to happen, it seems important that it could. That is, the possibility that liberal arts education could take place in a setting other than a liberal arts college or a university with a strong liberal arts emphasis is not one that can be ignored.

If there is any discernable trend toward change in American higher education at this time, it would seem to be closer to this third direction than to either of the first two discussed here. If, indeed, it is a trend, then, in my opinion, it is one that should be discouraged, not encouraged.

Implementing the career education concept, to me, represents a fourth possible direction for change in American higher education. Basically, it involves recognizing and acting on the high value most college students today place on the goal of education as preparation for work. Rather than ignoring this goal or trying to convince students it is an unwise one to hold, career education seeks institutional change that will provide suitable and appropriate assistance to students in attaining that goal. It does so through the simultaneous and coordinated use of a number of more specific changes including:

1. A change toward recognizing and providing opportunities for some combination of both liberal arts education and specific vocational skill training for all students. While the specific vocational skill training may, in part, be provided by course instruction, career education seeks to promote its acquisition through experiential education approaches including various forms of work experience, internships, practica, and observations in the occupational society itself. It recognizes that such experiences do not necessarily have to compete with regular on-campus courses; i.e., they can be acquired in after school hours, during summer periods, and can take place in

off-campus settings with some of the instruction being provided by persons who are not members of the regular teaching faculty. Some of this experience may be given academic credit but other parts may not. Similarly, some might represent paid activities while other parts may be unpaid.

2. A change toward encouraging a conscious recognition and emphasis on the part of the liberal arts teaching faculty of the contributions of liberal arts education to attaining the goal of education as preparation for work. This includes providing faculty opportunity to see and experience ways in which the liberal arts are valued by and valuable in the occupational society. Hopefully, this change will motivate both the liberal arts faculty member and the liberal arts student to better recognize the importance of the process, as well as the content, goals of liberal arts education.
3. A change toward a campus-wide emphasis involving the teaching faculty as well as student personnel workers on providing career development opportunities for all students. Like the experiential education emphasis, this may or may not involve time during the regular school day and/or formal courses taught for college credit. Its results should include helping each student acquire both a clearer set of career goals and a personally meaningful set of work values.
4. A change aimed at encouraging quality education through a competency oriented, performance based approach to evaluation of instruction. Such an approach is consistent with providing student records of accomplishment that should be attractive to those seeking to employ

college graduates. More importantly, it is consistent with career education's pervasive attempts to help students value work through giving them recognition and credit when they have worked.

5. A change aimed at a campus-wide emphasis on the broad, generic goals of higher education that extend beyond the goal of education as preparation for work. Unless this change takes place, a career education effort will inevitably be faced with the proverbial "pendulum problem" and can be predicted to have only a limited life. The current educational trend emphasizing process and content goals of instruction in the name of educational accountability requires supplementation in the form of a simultaneous emphasis on the broad, generic goals of higher education if a long-run sense of commitment and purpose is to be seen in the teaching/learning process. A number of such broad, generic goals has traditionally existed in higher education with education as preparation for work being only one of these. American higher education owes it to its students to provide a conscious emphasis on all of its generic goals so that students can be helped to understand and to take advantage of the multiple benefits of higher education.

6. A change toward expanding the ways higher education serves older adults as well as recent high school graduates. The three major emphases included in the career education strategy here are: (a) an emphasis on providing occupational upgrading in specific vocational skills for persons having graduated from college some years ago; (b) an emphasis on providing liberal arts education for persons in the occupational society needing such skills for entry into mid-management and upper-

management positions in the occupational society; and (c) an emphasis on providing liberal arts education for persons in the occupational society seeking ways of finding and engaging in a more personally satisfying total lifestyle. The career education concept strongly maintains that the days when American higher education existed primarily for purposes of serving youth are past.

Any one of these changes could, of course, be instigated on any given campus in the form of a specific programmatic effort. Career education seeks to remain as a concept that will serve as a catalytic "glue" for encouraging the coordinated insertion of all of these changes in the name of providing a more proper and appropriate emphasis on the goal of education as preparation for work. It is a direction for change that has been purposefully devised in hope that it will serve as a logical and reasonable way of resolving the apparently conflicting conditions outlined at the beginning of this presentation.

Concluding Remarks

It seems imperative, in the light of current conditions and projected future events, that American higher education must somehow address the problem of how it can best meet the goal of education as preparation for work. Liberal arts education, as part of higher education, will not benefit by ignoring this challenge nor by pretending that it has no bonafide role to play in its solution. Of the several alternatives available to higher education for meeting challenges for change resulting from this problem, the career education concept has been pictured here as one that calls for the active and positive involvement of liberal arts education.

It is hoped that those persons directly involved in liberal arts education will move toward implementing the career education concept in their change efforts.

BIBLIOGRAPHY

1. Austin, A.W., M. R. King, and G.T. Richardson, The American Freshman: National Norms for Fall, 1976. Los Angeles: Cooperative Institutional Research Program of the American Council on Education and the University of California at Los Angeles, 1976.

2. Baxter, Neale "Payoffs and Payments: The Economics of a College Education." Occupational Outlook Quarterly, 1977, 21, No. 2, 28-33.

3. Hoyt, K. Application of the Concept of Career Education to Higher Education: An Idealistic Model. Washington, D.C.: U.S. Government Printing Office, 1976.

4. Projections of Educational Statistics - 1985-86. Washington, D.C.: National Center for Educational Statistics, 1977.

5. "A Surplus of Grads" Washington Post, August 21, 1977.